South African Medical Journal

Organ of the Medical Association of South Africa

S.-A. Tydskrif vir Geneeskunde

Vakblad van die Mediese Vereniging van Suid-Afrika

Incorporating the *South African Medical Record* and the *Medical Journal of South Africa*

REGISTERED AT THE GENERAL POST OFFICE AS A NEWSPAPER

Vol. 25, No. 22 | Cape Town, 2 June 1951 | Weekly 2s

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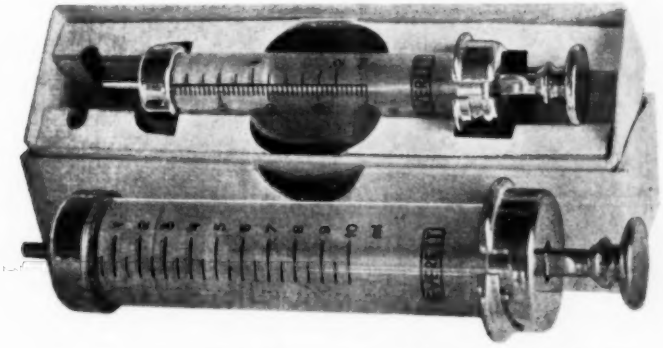

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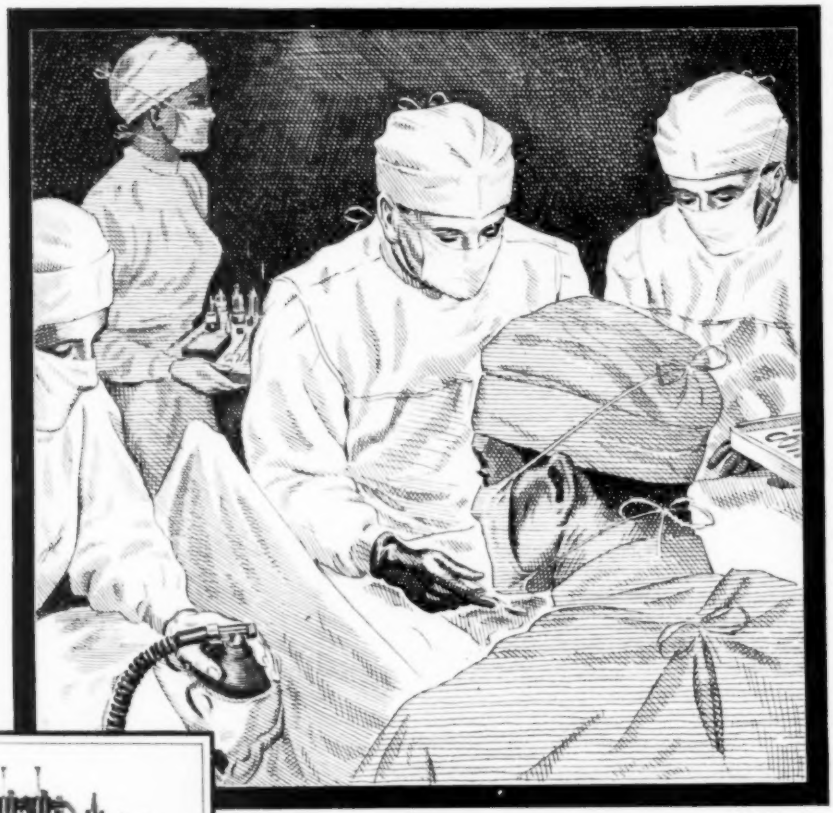

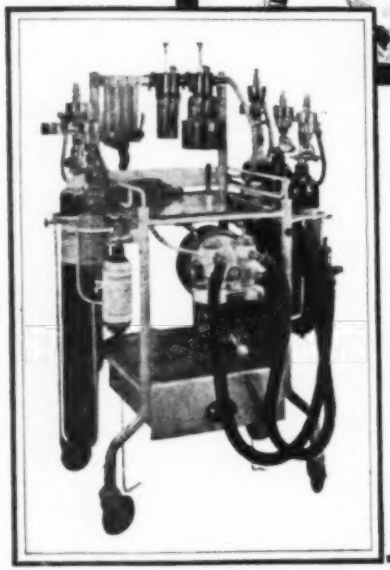

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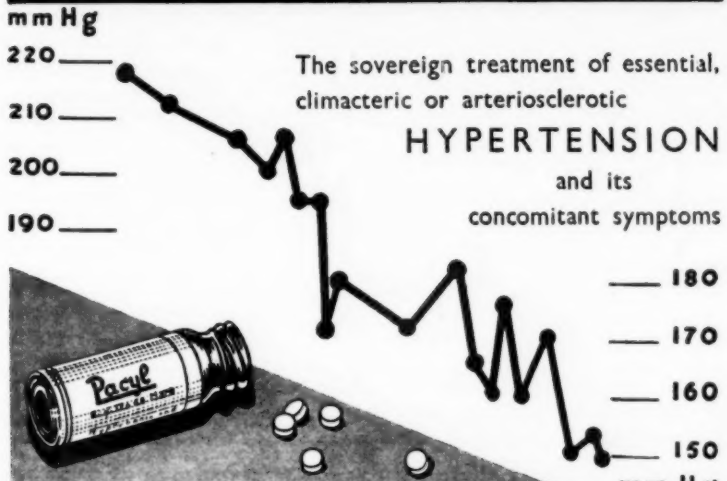

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South African Medical Journal
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IMPRESSIONS ON THE CLINICAL USE OF THE DIMETHYL ETHER OF d-TUBOCURARINE IODIDE

T. A. FULLER, M.B., CH.B., D.P.H.
and
A. B. BULL, M.B., CH.B.
Department of Anaesthesia, Groote Schuur Hospital, Observatory, C.P.

The use of muscle relaxants in anaesthesia has now become a routine practice with most anaesthetists. Since the introduction of curare into clinical anaesthesia in 1942, a number of relaxing agents have made their appearance. Only some of these, however, have passed through the stage of animal experimentation into common clinical use. The most recent addition to these is the dimethyl ether of d-Tubocurarine Iodide which is obtained by treating d-Tubocurarine chloride with sodium hydroxide and then with methyl iodide in methanol solution. By this means, the two free hydroxyl groups are methylated, and the salt changed from chloride to iodide. This is an apparently small change when one compares the structural formulae of the two drugs, but it brings about certain important differences in their action.

Animal experimentation with this compound, commonly known as D.M.E. or Dimethyl, has been carried out in England by Collier, Paris and Woolf,[1] and in the United States by Swanson, Henderson and Chen,[2] and has been reviewed recently by Collier and Hall.[3] These workers have shown that D.M.E. is a more effective curarizing agent than d-Tubocurarine in the rat, guinea-pig, rabbit and cat, but less active in the mouse. D.M.E. is antagonized by Neostigmine and there is evidence to suggest that it is no more active, weight for weight, in releasing histamine. However, as it is more potent, it is reasonable to suppose that with the smaller dose required histamine release may be less. No sensitivity or tolerance to repeated dosage has been noted in animals.

Clinical trials in man have been carried out by Stoelting, Graff and Vieira [4] and Wilson, Gordon and Raffan.[5]

During the past six months, D.M.E. has been used in a variety of cases at Groote Schuur Hospital and it is proposed to give here some general impressions regarding its use. No special selection as to the type of case was carried out and the age of patients ranged from 10 to 84 years. The patient's physical condition on coming to operation ranged from good to moribund. The nature of the operations are listed below (Table 1).

TABLE 1

Thoracotomies, lobectomies, pneumonectomies, oesophagectomy, decortication 14.
Thoraco-lumbar sympathectomy 6.
Lumbar sympathectomy 5.
Gastrectomy 19.
Cholecystectomy and upper abdominal procedures of like magnitude 16.
Porto-caval anastomosis 3.
Appendicectomy 50.
Gynaecological abdominal procedures 35.
Tonsillectomy 6.
Oesophagoscopy 3.

Induction of anaesthesia was with minimal dosage of thiopentone and maintenance with N_2O and O_2 in semi-closed circuit with intermittent doses of Pethidine. In all prolonged and major cases intravenous fluids were administered, sufficient to make up for loss during operation.

In this way it was hoped to obtain a picture of the action of Dimethyl with the least possible distortion due to deeper planes of anaesthesia.

Generally, the paralysing action of D.M.E. appears to be similar to that of d-Tubocurarine chloride. There are important practical differences, however, and the first of these is the difference in potency. Most workers so far have found D.M.E. to be 2-2½ times as potent as d-Tubocurarine chloride in man.

In our opinion, however, it is difficult to compare the potency of the two drugs in a general sense, as there seems to be a variation in potency depending on the field of operation, taking optimum operating conditions as a criterion. For example, in upper abdominal and intra-thoracic procedures it has been our experience that a quiet field of operation, free from spontaneous diaphragm movement, required from two-thirds to three-quarters the average amount of d-Tubocurarine necessary for the same purpose. However, in the lower abdomen adequate relaxation can be obtained with half the dose of d-Tubocurarine estimated as necessary to produce similar operating conditions.

A striking feature of D.M.E. is the persistence of diaphragmatic movement in spite of good muscular relaxation, unless large doses of the drug are given. This sparing of the diaphragm occurs to such an extent that it is frequently possible to produce adequate lower abdominal relaxation and yet have adequate respiratory exchange without resorting to manual assistance or control of respiration.

Similar persistence of diaphragm movement is seen to some extent with other relaxants as well, notably with Flaxedil according to some with Decamethonium Iodide (Eulissin), but it is by no means as marked as with D.M.E. and we have invariably found with these other drugs that adequate abdominal relaxation is always accompanied by a degree of respiratory depression which makes assisted respiration a necessity.

Paralysis of the intercostal muscles appears to occur at the same time as that of the abdominal muscles. The persistence of diaphragmatic respiration with D.M.E. is difficult to explain. It may possibly be due partly to a less marked action on the central nervous system. In the case of decamethonium iodide, however, we feel that spontaneous respiration will only occur when a sufficiently strong stimulus to respiration occurs to break through the barrier set up by the decamethonium. As long as anoxia and hypercarbia are avoided with decamethonium iodide, and no excessive stimuli come from the operative field, spontaneous respiration does not seem to occur. For further detail regarding this aspect, the work of Paton and Zaimis,[6] and of Hunter,[7] is of great interest.

The duration of action of D.M.E. is somewhat less than that of d-Tubocurarine, the average time being 20-30 minutes with individual variations somewhat more marked than obtaining with d-Tubocurarine.

The onset of action is somewhat more rapid than with d-Tubocurarine, the maximum effect being obtained in from 1½-2 minutes after intravenous injection. Relaxation of the cords and pharyngeal muscles is not good; it appears that those muscles are spared to the same extent as the diaphragm. Intubation with D.M.E. is often difficult for this reason unless large doses are used. On account of this disadvantage we have frequently used decamethonium iodide initially for intubation and followed this with D.M.E. when the relaxation produced by decamethonium iodide was passing off.

The combination of these two drugs in the above sequence appears to have no undesirable effects, as might be supposed from their different modes of action. There appears to be a strong synergism between them, and the action of the D.M.E. following decamethonium iodide appears to be both intensified and prolonged. This is in keeping with the findings of Castillo, Phillips and de Beer[8] who found that d-Tubocurarine following decamethonium iodide in the cat potentiated the action, while if the two drugs were given in the reverse order an inhibitory action was produced.

There appears to be a greater all-round individual variation in action of D.M.E. as compared with d-Tubocurarine, but in no case have we been unable to produce adequate relaxation. No untoward effect on the circulatory system has been noted clinically.

Prolonged administration for periods up to five hours with a total dosage of 40 mg. have produced no untoward reactions or fall in blood pressure, nor has there been any delay in recovery. Here it may be said that intercostal paralysis appears to persist rather longer than with d-Tubocurarine.

It is claimed that D.M.E. causes less histamine release than d-Tubocurarine. In this respect we can only say that no bronchospasm has occurred in any of our cases. In intrathoracic operations in particular, no suggestion of difficulty in inflating the lungs was encountered which might have been due to bronchospasm.

It would seem that D.M.E. might prove of greater value in the treatment of spastic states and tetanus than other relaxants on account of the lesser degree of respiratory depression produced. Thus far we have not had the opportunity to use it in this field, nor can any report be given of its use in electroconvulsive therapy.

In our opinion, D.M.E. is an excellent curarizing agent. For lower abdominal procedures it is perhaps the relaxant of choice owing to its property of sparing diaphragmatic repiration to so large an extent. In the upper abdomen it produces relaxation comparable to that produced by d-Tubocurarine with the possible added advantage that bronchospasm appears to be less frequent.

It must be emphasized that although diaphragmatic movement is occurring, this does not always mean that adequate respiratory exchange is taking place; it is not in every case that assisted respiration can be dispensed with when using D.M.E.

We wish to thank Messrs. Allen and Hanburys (Africa) Ltd., for their generous co-operation in making available the supplies of D.M.E. used.

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ABSTRACT

D. R. Talbot, A. C. Elerding and J. O. Westwater. *Epilepsy and Malaria.* Journal Amer. Med. Assoc. (1949): **141**, 17 December.

The authors present a few cases in which chronic recurrent malaria was the probable causative agent of cerebral damage manifested by convulsive seizures and abnormal electroencephalograms characteristic of epilepsy.

Pathologic conditions of the central nervous system incident to the severe type of recurrent malarial infection must be vigorously treated. In convulsive conditions, such as those reported, treatment of the malaria is of primary importance. Recent progress in malaria therapeutics provides an unprecedented opportunity to halt the process before further damage is done.

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South African Medical Journal
Suid-Afrikaanse Tydskrif vir Geneeskunde

VAN DIE REDAKSIE

DIE COXSACKIE-VIRUS

Aansienlike belangstelling is gewek deur die ontdekking van 'n nuwe virus wat 'n siekte skyn te veroorsaak wat ooreenkoms vertoon met die nie-verlammende vorm van poliomiëlitis. Die virus is die eerste keer in 1947 deur Dalldorf en Sickles [1] afgeskei van die ontlasting van twee kinders in die dorp Coxsackie in die staat New York. Alhoewel die siekte in hierdie twee gevalle 'n ooreenkoms met poliomiëlitis vertoon het, en daar in die dorp ses ander pasiënte met 'n soortgelyke siekte was wat na gemeen is poliomiëlitis gehad het, is die nuwe virus as 'n waarskynlike etiologiese middel beskou. Daar is bewys dat serum van die kinders in die akute en herstelstadium 'n neutraliserende werking op die Coxsackie-virus het.

Gedurende daardie jaar was gevalle van poliomiëlitis in 'n ligte graad algemeen in die Verenigde State. Daar is inderdaad opgemerk dat nie-verlammende vorms van die siekte die aantal klaarblyklik verlamde gevalle op buitengewone wyse oortref het. Daarbenewens kon die poliomiëlitis-virus by baie van hierdie ligte gevalle nie gevind word nie.[2, 3] Dit wil nou voorkom of baie van hierdie pasiënte moontlik met die Coxsackie-virus besmet was.

Toe die skadelikheid [4] van die virus vir verskillende diere ondersoek is, is 'n belangrike resultaat verkry. Die virusmiddel is in die geval van muise, hamsters, marmotjies, ape en bevrugte hoendereiers getoets. Hiervan het slegs die muise en hamsters tekens van siekte getoon en daar is gevind dat muise slegs gedurende die eerste twaalf dae na geboorte vatbaar is. Die ontkiemingstyd was drie dae. 'n Histologiese studie van 25 sogende muise en twee sogende hamsters het bewys dat feitlik by al die diere wydverspreide ontaarding van die spiere ingetree het. Daarna het regenerasie in die vernietigde spiere plaasgevind en hulle 'n sellulêre voorkoms gegee.

Geen poging is aangewend om vas te stel of die nuwe virus van normale persone of van pasiënte met ander siektes afgeskei kan word nie. Dit sou dus voorbarig gewees het om af te lei dat die Coxsackie-virus die etiologiese agent van hierdie siektes was wat gekenmerk is deur irritering van die harsing- en rugmurgvlies en ooreenkoms vertoon het met nie-verlammende poliomiëlitis.

Melnick *et al.*[5] het ook die afskeiding beskryf van 'n filtreerbare middel (wat hulle soortgelyk geag het aan dié wat deur Dalldorf en Sickles ontdek is) afkomstig van pasiënte met 'n siekte wat ooreenkoms vertoon het met nie-verlammende poliomiëlitis wat gedurende 1948 in suidelike Nieu-Engeland voorgekom het. Hierdie virus het

1. Dalldorf, G. en Sickles, G. M. (1948): Science, **108**, 61.
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EDITORIAL

THE COXSACKIE VIRUS

Considerable interest has been aroused by the discovery of a new virus which appears to cause a disease resembling the non-paralytic form of poliomyelitis. The virus was first isolated by Dalldorf and Sickles [1] in 1947 from the faeces of two children in the village of Coxsackie in New York State. Although the illness in these two cases resembled poliomyelitis, and there were in the village six other patients with a similar illness who had been thought to have poliomyelitis, the new virus was considered a likely aetiological agent. Serum from the children in the acute and convalescent phase was shown to have a neutralization activity for the Coxsackie virus.

During that year mild cases of poliomyelitis were common in the United States. It was, in fact, remarked that non-paralytic forms of the disease unduly exceeded the number of obviously paralysed cases. Furthermore, from many of these mild cases the poliomyelitis virus was not recoverable.[2, 3] It would now appear that many of these patients were possibly infected with the Coxsackie virus.

When the virus' pathogenicity [4] for various animals was investigated, an important result was obtained. The viral agent was tested in mice, hamsters, guinea pigs, monkeys and fertile hens' eggs. Of these, only mice and hamsters showed signs of disease, and mice were susceptible only during the first 12 days of life. The incubation period was three days. Histological study of 25 suckling mice and two suckling hamsters showed that in nearly all the animals widespread degeneration had occurred in the skeletal muscles. Subsequently regeneration occurred in the destroyed muscle, giving it a cellular appearance.

No effort had been made to discover whether the new virus could be isolated from normal persons or from patients with other diseases. It would therefore have been premature to conclude that the Coxsackie virus was the aetiological agent in these illnesses characterized by meningeal irritation and resembling non-paralytic poliomyelitis.

Melnick *et al.*[5] also described the isolation of a filterable agent (which they considered similar to that discovered by Dalldorf and Sickles) from patients with an illness resembling non-paralytic poliomyelitis which occurred during 1948 in southern New England. This virus also

1. Dalldorf, G. and Sickles, G. M. (1948): Science, **108**, 61.
2. Sabin, A. B. and Steigman, A. J. (1949): Amer. J. Hyg., **49**, 176.
3. Rhodes, A. J. *et al.* (1949): Canad. Med. Assoc. J., **60**, 359.
4. Dalldorf, G. *et al.* (1949): J. Exper. Med., **89**, 567.
5. Melnick, J. L. *et al.* (1949): Proc. Soc. Exper. Biol. Med., **71**, 344.

ook pasgebore muise besmet en hulle swak en lam gemaak. By histologiese ondersoek is verspreide miositis waargeneem. Hierdie navorsers het die ontlasting van 16 pasiënte ondersoek waarvan 13 kliniese eienskappe van nie-verlammende en drie dié van verlammende poliomielitis getoon het. Ontlastingsmonsters van vyf van die pasiënte het siekte by pasgebore muise veroorsaak maar nie by ape nie. Die serums van sewe pasiënte van wie die nuwe filtreerbare middel afgesonder is, het die virus geneutraliseer.

Daar is bewys dat die virus gedurende die somer van 1948 in die Verenigde State wyd versprei was; dit is afgeskei van die rioolstof van 'n aantal stede en van vlieë wat versamel is op wyd uitmekaar geleë plekke. Die soorte van die virus wat vir jong muise skadelik is, is dus wyd versprei in die natuur.

Die kliniese eienskappe van 10 pasiënte met die sindroom van aseptiese meningitis of nie-verlammende poliomielitis en van wie die Coxsackie-virus afgeskei is of wie se serum die virus geneutraliseer het, is beskryf.[6] By almal van die pasiënte, met een uitsondering, het koors op die eerste dag van die siekte begin. Hoofpyn, mislikheid, 'n stywe nek of rug en pyn in een of meer ledemate is dikwels waargeneem. Die siekte was gewoonlik kort van duur—van een tot 10 dae. In die meeste gevalle is pasiënte in die hospitaal opgeneem omdat 'n stywe nek opgemerk is. Leukosiettellings in die serebrospinale vloeistof het van 27 tot 600 selle per 100 c.c. gewissel.

Dit lyk of daar verskeie antigeentipes van die Coxsackie-virus is. Almal is skadelik vir sogende muise en hamsters; hierdie diere is nie vatbaar wanneer hulle ouer is nie. Die virus is ook afgeskei in gevalle van borspierpyn en ligte ongedifferensieerde koors.[6] Besmettings is aangemeld in die geval van laboratoriumwerkers wat die virus bestudeer het.

Navorsing wat nou aan die gang is, sal ongetwyfeld binnekort die betekenis van die virus bepaal. Dat die virus algemeen in Suid-Afrika aangetref word, is nog nie aangemeld nie. Die behoefte aan 'n deeglike laboratoriumondersoek van die ligte en atipiese vorms van „poliomielitis" is egter klaarblyklik.

6. Curnen, E. C. *et al.* (1949): J. Amer. Med. Assoc., **141**, 894.

infected newborn mice, producing weakness and paralysis. On histological examination a diffuse myositis was seen. These workers examined faecal samples from 16 patients, 13 of whom had clinical features of non-paralytic and three of paralytic poliomyelitis. Faecal samples from five of the patients produced diseases in newborn mice but not in monkeys. The sera of seven patients from whom the new filterable agent was isolated, neutralized the virus.

During the summer of 1948 the virus was shown to be widespread in the United States: it was isolated from the sewage of a number of cities and from flies collected in widely separated areas. The strains of the virus pathogenic for infant mice are thus widely distributed in nature.

The clinical features have been described in 10 patients having the syndrome of aseptic meningitis or non-paralytic poliomyelitis and from whom the Coxsackie virus was isolated or whose serum neutralized the virus.[6] In all but one of the patients, fever developed on the first day of illness. Headache, nausea, stiffness of the neck or back and pain in one or more limbs were noted frequently. The course of the illness was usually brief, lasting from one to 10 days. In most instances the patients were admitted to hospital because neck stiffness had been detected. Leucocyte counts in the cerebrospinal fluid ranged from 27 to 600 cells per 100 c.c.

It appears that there are several antigenic types of the Coxsackie virus. All have a pathogenicity for suckling mice and hamsters; these animals, when older, are not susceptible. The virus has also been recovered in cases of pleurodynia or mild, undifferentiated fever.[6] Infections have been reported in laboratory workers who were studying the virus.

Research now in progress will no doubt establish the significance of the virus in the near future. That the virus is commonly found in South Africa has yet to be reported. However, the need of thorough laboratory investigation of the mild and atypical forms of 'poliomyelitis' is obvious.

6. Curnen, E. C. *et al.* (1949): J. Amer. Med. Assoc., **141**, 894.

THE GENERALIZED DEVELOPMENTAL OSSEOUS DYSTROPHIES

3. MORQUIO'S DISEASE

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Clinical Features. Morquio's disease[1] also presents a characteristic appearance. The severe cases are grotesque, short-necked, round-shouldered, hunch-backed, pigeon-chested, knock-kneed, flat-footed dwarfs, waddling like ducks, with head thrust forward, hips and knees flexed, and hanging arms which look too long for their stunted bodies. The condition is not usually present at birth, but becomes evident during childhood with failure to gain height, increasing muscular weakness, alterations in stature and progressive crippling. Intelligence is unaffected. The head is normal except that the nasal bridge may be depressed. Kyphosis is extreme and may be angular, the spine short and almost immobile. The thorax is narrow and prominent anteriorly, while the respiratory excursion and vital capacity are greatly diminished. The joints may be enlarged and knobbly and movement excessive or restricted. The bony swellings and deformities of the finger joints may resemble those of rheumatoid arthritis.

The limbs are not short and orthopaedic deformities are due to defects around the joints.

The degree of skeletal deformity is very variable. Brailsford,[2] who introduced the ambiguous name 'chondro-osteo-dystrophy', recognizes four categories or degrees of

Fig. 1 (Case 1). Indian boy aged 5½ with three affected siblings. Lateral view of spine, showing typical deformities of vertebral bodies; particularly the central tongues.
Fig. 2 (Case 1). Thick, flattened femoral heads and necks with relatively good epiphyses. Shallow acetabula and wide joint spaces. False joints between femoral metaphyses and ischia.
Fig. 3 (Case 1). Knee joint to show flaring of metaphyses and wide joint space.

Fig. 4 (Case 1). Short stumpy finger bones with irregularities at their ends.
Fig. 5 (Case 2). European boy aged 13, complaining of muscular weakness, stoop and prominence of lower chest since the age of 10. A very mild case of Morquio's disease. The illustration shows platyspondyly and local irregularities in vertebral surfaces with some wedging. No tongue formation. The hips were also mildly affected.

severity, the most severe cases dying in childhood, the mildest showing spinal irregularities only.

Inheritance. Although many patients suffering from Morquio's disease are the only affected members in their families, enough pedigrees have accumulated to show that the condition is inherited as a typical autosomal Mendelian recessive. Thus cousin marriages are frequent in affected families; the parents of a sufferer are themselves both normal; the chances of any later child being deformed are 3:1 against, and children of the patient will not be affected as long as he or she has married a normal unrelated person.

X-ray Features. The spinal changes are pathognomonic. The vertebral bodies are flat, their diameters increased and height diminished (platyspondyly). In a lateral film the surfaces are seen to be irregular and poorly defined, with central prolongations or tongues protruding anteriorly (Fig. 1). This is seen best in the lower dorsal and upper lumbar vertebrae, one of which is sometimes small, wedge-shaped and displaced backwards.

The epiphyses of the long bones, particularly the hips, may be enlarged, fragmented, irregular, ill-defined and poorly calcified. The acetabula are correspondingly large, irregular and shallow (Fig. 2). Joint spaces are characteristically wide (Fig. 3). The femoral necks become thick, short and horizontal, producing coxa vara. The metacarpals and phalanges may be short, stubby and irregularly shaped with enlarged multicentric epiphyses (Fig. 4).

Differentiation from Achondroplasia. The literature is replete with examples of Morquio's disease mislabelled achondroplasia, although apart from the dwarfing there are almost no points of similarity. The shape of the head, the spinal and thoracic deformities and the length of the limbs are fundamentally different. The legs are bowed in achondroplasia, the epiphyses are not deformed or enlarged. In achondroplasia the defect is present at birth and the inheritance is dominant; if the child lives it becomes stronger; the Morquio child becomes more feeble. An 'atypical achondroplasiac' is probably not achondroplastic.

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SKIN SENSITIVITY TO STEROID HORMONAL SUBSTANCES

A DISCUSSION OF THE POSSIBLE MECHANISM OF ENDOCRINE ALLERGY

RESULTS OF TESTING 140 MALE AND 19 FEMALE SUBJECTS*

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The influence of the menstrual cycle and of pregnancy on the evolution and the course of allergic disorders is a well-recognized clinical experience. Whilst hormonal factors are suspect, it is difficult to know whether their action is based on either a deficiency or excess of one or more hormones; or whether it is due to sensitization to endogenous hormones, the resultant antigen-antibody reaction producing the symptoms under consideration. In a study of 148 female patients Waldbott[30] states that 47 gave a history of premenstrual aggravation of symptoms; he claims that an oestrogen deficiency can be demonstrated in them. He also states that 'in contrast with the observations of Zondek and Bromberg,[34] skin reactions with extracts of oestrogenic substances were inconclusive upon intracutaneous testing'. In an investigation of cases of allergic rhinitis at the menopause (to be published) Lucas and Pepys found a group of patients presenting with typical allergic rhinitis, the onset of symptoms being related to the menopause; 35 of these patients benefited rapidly and considerably from treatment with synthetic oestrogens alone, in spite of positive clinical histories and positive skin tests to inhalant allergens. Since the response was contemporaneous with the administration of the oestrogen, it was felt that the effect produced was not due to any 'desensitizing' action in the allergic sense, and that the hormonal disturbance had uncovered a latent allergic tendency. There remains, however, a large number of patients in whom a condition of hypersensitivity appears to offer an explanation of the clinical picture. Zondek *et al.*[34-36] describe such a condition of auto-endogenous sensitization under the title of 'Endocrine Allergy'.

The possibility of sensitization to endogenous tissue products and by inference to endogenous hormonal products will be discussed from two aspects:—

1. Sensitization produced by antigens of endogenous origin.

2. Sensitization produced by antigens of exogenous origin, the antigens being homologous tissue products and hormonal substances.

1. *Sensitization to Endogenous Antigens.* The instances quoted indicate the production of allergic sensitivity to endogenous tissue products, the antigen being produced either by infection or trauma. For example, anti-kidney antibodies in the blood of post-scarlatinal patients are reported by Schwentker and Comploier,[21] and Woods[33] has shown that patients with sympathetic ophthalmia give positive skin reactions to extracts of uveal pigment. Verhoeff and Lemoine[29] and Courtney[6] report on lens

* The References will be published at the end of the concluding part of this paper.

protein sensitivity in skin tests on patients suffering from endophthalmitis phaco-anaphylactica.

2. *Sensitization to Exogenous Tissue or Hormonal Antigens.* Burky[3, 4] reports on the experimental production of sensitivity to endogenous lens and muscle tissue by the use of a combination of homologous tissue with a toxin or bacterial adjuvant as the sensitizing antigen. Hecht, Sulzberger and Weil[13] were able to produce anti-skin antibodies by sensitization with skin extracts plus staphylococcal toxin. There are now increasing numbers of reports on the production of organ-specific sensitivity by this technique.

The evidence bearing on sensitization to hormonal products of exogenous origin is both experimental and clinical. There is acceptable evidence for the production of sensitivity to the protein hormones, but the ability of the steroid hormones to act as antigens is much more controversial. Specific antihormones could not be produced with chemically pure oestrogens, androgens, progesterone and epinephrine by Thomson *et al.*,[24] and in experiments on rats D'Amour *et al.*[7] were unable to produce antihormones to oestrin. Several groups of workers (Sacks and Klopstock,[19] Plaut and Kasowitz,[18] Weil, Brendes and Weil[32]) claim to have produced antibodies to steroids by combining them with heterologous serum proteins. Brandt and Goldhammer[2] produced complement-fixation antibodies by combining Progynon and Proviron with pig serum. The antisera produced reacted with both steroids and with others such as cholesterol, ergosterol and phytosterol, a vegetable sterol. Their work confirms the impression that, whilst pure lipoids are incapable or weakly capable of producing antibodies, they can do so when combined with serum or tissue protein. The serological specificity between different lipoids is not high compared with that of the protein antigens. There is much clinical evidence of sensitization due to the administration of exogenous protein hormones, the most significant instance being that of insulin sensitivity, where Campbell *et al.*[5] report that positive reactions were obtained with human insulin in addition to the other insulins in cases of insulin allergy. This is an example of sensitization to a homologous hormonal product. Pituitary extracts, liver extracts and chorionic gonadotrophin are all known to be capable of producing antibodies and sensitization.

The clinical evidence with regard to the steroid hormones is limited. Zondek and Bromberg quote clinical observations on the incidence of nausea, vomiting, fever, diarrhoea, urticaria and aggravation of pruritus vulvae produced by injections of oestrone and oestradiol benzoate. They consider the dosage to have been too high and they claim that smaller doses may act beneficially by desensitization. Gillman,[11] in an investigation on the effects of progesterone on the menstrual cycle, records the production in certain patients of rhinorrhoea, lower abdominal pain, headache, malaise, not necessarily associated with disturbance of the menstrual rhythm. These reactions may have been toxic or possibly allergic and some of them are included by Zondek and Bromberg in the symptomatology of endocrine allergy.

The occurrence of purpura, without abnormal blood findings, following on the use of oestrogens, is recorded by Loftus[16] in a female aged 44 years who was suffering from contact dermatitis. Cessation and resumption of treatment was paralleled by the cessation and recurrences of the purpura. Repeated tests with the oestrogen in different vehicles were positive. Herbst[14] reports two cases of purpura, without reduction of platelets, occurring in men who were receiving oestradiol propionate for prostatic carcinoma.

In five cases, four female and one male, purpura was observed during oestrogenic therapy by Watson *et al.*[31] They report that positive skin tests were obtained in three of these cases, two to oestrone and two to stilboestrol and in one patient to both substances. These patients had been under treatment for prolonged periods of 2½-7 years, though this was intermittent or irregular in two cases. They suggest that a specific tissue sensitivity was present and also that there may be a possible relationship of purpura to endogenous oestrogens, though the nature of the reactions was not understood. Two female cases in the present study who were investigated for steroid sensitivity suffered from thrombocytopenic purpura and will be reported on in more detail. There is some experimental evidence in this regard reported by Tyslowitz and Dingemanse,[28] who produced myeloid depression in dogs by giving daily doses of oestrone. Whether the cases reported above were based on a toxic depression of the myeloid tissue or a sensitization is not clear.

Another report on steroid hormonal sensitization is that of Sison *et al.*[22] who describe a case of recurrent peritonitis in a patient with a strong personal and family history of allergy. The peritonitis occurred in association with pregnancy and the puerperium and was accompanied by an eosinophilic ascitic fluid and a peripheral blood eosinophilia. The use of adrenalin produced relief. They suggest that the patient was sensitive to oestrone since an injection of 1 c.c. of oestrone (2,000 units) produced a recurrence of the peritonitis after 18 hours. A large erythematous area which persisted for three months was produced at the site of injection. Tests with the peanut oil vehicle were negative.

Zondek and Bromberg report a high incidence of hormonal sensitivity in their original description of the results of their tests on 182 female patients, whose symptoms were related to the menstrual cycle and who had an allergic background. According to the authors, it is this selection of cases which accounts for the high incidence of positive reactions. They claim that this condition, named by them 'Endocrine Allergy', fulfils the criteria of an allergic disorder based on an antigen-antibody reaction to a specific hormonal substance. They describe various types of skin reaction: the positive reaction within 24-48 hours; a 'retarded' reaction appearing in relation to the next menstrual cycle, and a 'recurrent' reaction produced at the original test site by a provocative injection of the specific steroid. These authors report beneficial results with the use of the specific hormone for desensitization in patients giving positive reactions.

Hartman[37, 38] has reported good results with hormonal treatment in allergic disorders. He bases his treatment on the known physiological variations of hormonal

production, and also on possible allergic sensitivity to oestrogenic hormones. He states that menopausal cases are benefited by the use of oestrogens, that premenstrual cases benefit from the use of testosterone or desensitization with oestradiol, and that in menstrual cases timed injection or ingestion of oestrogen are indicated. Positive skin tests are obtained with oestrogenic substances in the premenstrual group and he bases the desensitization treatment on these results. He makes the point that whilst the positive skin reaction may be an index of the patient's tissue susceptibility to the irritant action of the oestrogen, the production of positive passive transfer tests indicates that the reaction is due to allergic sensitivity.

The difficulties associated with the passive transfer tests are discussed later; it also needs to be mentioned that the passive transfer sensitivity in tests which produce delayed reactions is subject to controversy and that in cases of proven bacterial sensitivity which react with a delayed reaction the sensitivity can only be transferred by special techniques. For these reasons there appears to be some element of doubt in what would otherwise have been a satisfactory proof of allergic sensitivity.

Baer *et al.*[1] report on the finding of positive reactions to steroid hormones in four out of 33 female patients with dermatoses related to menstruation or the menopause. Two of the three cases had urticaria and benefited from desensitization. In 64 controls suffering from conditions not related to the menses, three reacted to the olive oil vehicle, and 11 (about 20%) gave questionable or inconclusive reactions to one or more steroids. They conclude that 'this method of testing would not appear to be promising as a routine investigative procedure for a large series of cases, though the positive results observed in a few cases, and the encouraging results with specific therapy indicate that the method deserves further trial in properly selected cases'. Hajos[12] reports on the testing of 79 female patients with the production of 68 positive reactions. In 12 male cases reactions were obtained which she regarded as 'more or less' positive. Reactions to more than one steroid at the same time were also recorded, and she claims that specific desensitization in patients reacting to one steroid was beneficial.

In discussions with other interested workers the difficulties which Baer *et al.*[1] mention and of which Zondek and Bromberg have taken notice, have been found common to all. The difficulties associated with the materials and the technique used for testing and with the interpretation of the results obtained have previously hampered those desiring to elicit specific and reliable information by this method of testing.

In assessing the results obtained in this investigation of 140 male and 19 female patients for skin sensitivity to steroid substances, it is necessary that they should be viewed in the light of the difficulties encountered. The problems related to the testing will be discussed later. It would also appear desirable, in this form of testing, perhaps more than in other better-established methods of testing for allergic sensitivity, to interpret all results critically and to obtain corroborative information of a serological or clinical nature before accepting any result as indicative of allergic sensitivity to the particular test substance.

DISCUSSION OF THE SKIN-TESTING MATERIALS AND THE TECHNIQUE OF TESTING

1. *The Olive Oil Vehicle.* Despite neutralization of the olive oil and prolonged heating Zondek found that 7.5% of 40 healthy females reacted to an intradermal injection of 0.1 c.c. of oil. Of the 140 male subjects tested in this series 11.3% reacted to the olive oil within 24-48 hours. It has been the usual experience to find, as Baer *et al.* report, that 0.1 c.c. of olive oil can produce positive reactions almost regularly if injected superficially intradermally.

A chemical analysis of the olive oil used in the present series showed it to be of high quality and to comply with the B.P. requirements. It was free of sesame oil, cotton seed or arachis oil. A minute amount of protein, 0.005%, was found and a generic test for sterols was positive and indicated the presence of one or more sterols, which were probably phytosterols, since the olive oil is of vegetable extraction. The presence of phytosterol and the minute amount of protein may be concerned with the development of sensitivity to the olive oil which is manifested by the production of a delayed reaction appearing after 2-3 weeks. This interval would fit in with the usual period required for the onset of sensitization. Since the oil is poorly absorbed some of it could remain at the injection site until antibodies are formed and the reaction could then take place. The phytosterol present may have some significance since, in view of the experimental evidence quoted earlier regarding the serological affinity of sera produced by Progynon and Proviron for phytosterols, it may require to be considered in interpreting 'retarded' or delayed reactions.

2. *Delayed Reactions to Olive Oil.* Eighteen male and female patients were given an intradermal injection of 0.1 c.c. of olive oil and were observed for more than three weeks in the present investigation. In four of the 18 cases, delayed reactions occurred in the form of red, irritating patches at the test site. These appeared between two and three weeks after testing. Re-injection in two cases of 0.1 c.c. of olive oil produced no effect within seven days. A personal communication from Dr. K. Maunsell[16a] states that two out of 10 patients tested with the oil reacted after two-three weeks. In one instance the re-injection of olive oil produced a severe local reaction within two days, and was associated with much sneezing. Baer *et al.* report a reaction to peanut oil occurring after three weeks and suggest that similar reactions may occur with the olive oil vehicle.

This delayed reaction to the olive oil is interesting and of clinical importance. It suggests the development of allergic sensitivity to a vegetable oil vehicle. Such cases of sensitivity are reported in the literature and the reactions observed on continued injection may be very troublesome. Thus, Freed[10] proposes the use of aqueous suspensions of oestrone and testosterone for therapeutic use, in order to avoid the local allergic or irritant reactions to the commonly used vegetable oil vehicles. He states that sesame oil is the least allergenic of those he tried and suggests that the incidence of reactions may amount to 20%. Thorn and Firor[25] and Thorn, Howard and Emerson[26] report two cases where intramuscular injections of DOCA in sesame oil were associated with constitutional and local reactions. These disappeared on cessation of treatment. An injection of sesame oil

produced a marked positive skin reaction and a febrile response in one case. Levison and Harrison [15] describe a case of severe allergic dermatitis following on parenteral use of theelin. Skin sensitivity to peanut oil and cottonseed oil were found to be present.

In a series of 48 patients parallel tests were carried out with sesame oil: 19% of reactions were obtained as compared with 11.3% with the olive oil. Baer *et al.*[2] suggest that peanut oil may be suitable as a vehicle. Whether it is suitable or not, the use of an oily vehicle at all is a great disadvantage and a source of unreliability in interpreting the reactions obtained.

In an attempt to avoid an oily vehicle, 23 patients were given intradermal injections of a 9% benzyl-alcohol suspension. This forms a milky fluid with a watery consistency. Reactions were obtained in all cases after injection in each of 0.02 c.c., 0.05 c.c. and 0.1 c.c. The reaction was that of a small area of necrosis with the production of a superficial ulcer and it ruled out the use of this vehicle for further testing.

3. *Steroids Used for Testing.* The choice of the steroids for testing is, in a sense, arbitrary, since whilst the better-known steroids were chosen by Zondek and Bromberg and were used in this study, increasing numbers are being isolated. The steroids used were the following pure crystalline steroids and their esters prepared in a concentration of 1 mg. of test substance in 1 c.c. of olive oil: cholesterol, *alpha*-oestradiol, oestradiol monobenzoate, oestrone, progesterone, androsterone, testosterone desoxycorticosterone acetate and calciferol. These steroids possess a close chemical and biological relationship and it is not surprising that some patients appear to react to more than one steroid and that provocative injections were capable of producing recurrent reactions at more than one test site in some of the cases studied. In one instance both oestrone and *alpha*-oestradiol reacted simultaneously after a provocative dose of oestrone.

The other properties of these steroids require consideration. The use of implantation pellets of the sex hormonal steroids has shown that they provoke a local reaction in the tissues. Foss [9] reports that testosterone is followed by progesterone in having a greater tendency to slough out than oestrone and oestradiol. A capsule forms around the pellet, testosterone forming the thickest capsule (followed by progesterone) and both produce the capsule in a much shorter time than the other steroids. In assessing the local reactions produced on testing, this factor requires consideration and could explain the persistence of erythema at the reacting areas.

Saline suspensions of the steroids were unsatisfactory, since the sterols do not suspend well and tend to deposit in the syringe during the injection. The dose cannot be estimated accurately and the reactions are very inconstant and irregular. Watson *et al.*[31] describe positive reactions observed in their cases with saline suspensions of oestrone and stilboestrol. These were erythematous flares from 1 cm. × 1 cm. to 2 cm. × 3 cm. which appeared in half an hour and faded 1½ hours. Zondek and Bromberg found their reactions with this material to be transitory and inconstant. These suspensions were also used for testing for passive transfer reactions and suggestive though not definite reactions were obtained in two female patients.

The reactions produced on testing passive transfer sites with this material were whealing, erythema and slight itching. Saline suspensions of the steroids can produce erythema *per se* and the size of the dose, 0.1 c.c., can produce non-specific whealing. It is not possible, for these reasons, to accept such reactions as positive proof of successful passive transfers.

4. *Technique of Injection.* The injection of 0.1 c.c. of an oily substance into the skin at a uniform depth for 10 or 11 tests is a difficult task and, since the oil can produce non-specific reactions if given too superficially, any results obtained should be held in doubt until confirmation is obtained either clinically or in some other way.

The injection of the test materials slightly deeper into the skin than for the ordinary intradermal test is described by Zondek and Bromberg. Baer *et al.*[1] state that Zondek's personal instructions were to this effect and that with this method a small elevation was produced which disappeared immediately. An attempt to pursue this further was made in seven cases. Injections were given in parallel series both superficially and deeply; in four cases they produced the same positive reactions at both levels. Such a method of control, i.e. repetition of doubtful injections at a deeper level, may be of some assistance.

The placing of the injections is important, since reactions may appear after an interval of weeks and skin pencil markings do not persist. It is also necessary to rely on the patient's information about which site has reacted, and then to identify the site by comparison with the record of the injections. To overcome this difficulty, the injections were given in a constant order. In the upper arm the antero-lateral aspect was used, the injections being given along a line from the tip of the acromion process to the tip of the lateral condyle of the humerus. Injections were given at 1½" intervals, starting 2" from the acromion tip. On the back, the vertebra prominens was used as a landmark and injections were given 2½" to 3" lateral to the spinous processes and 2" away from each other. The skin on the arm was preferred, since it is less tense, and it was found that patients with thick and greasy skins which were difficult to pick up between the fingers were the most frequent non-specific reactors. The influence of rubbing in the production of non-specific reactions must be allowed for where friction can occur, as it may do on the back.

The reading of the reactions was carried out at 24 hours and 48 hours and in some cases daily over periods of two to three weeks. The late reaction to the olive oil previously reported indicates that observations at these late periods may reveal the development of sensitivity to the oil, or the occurrence of retarded reactions to the steroids. Where a vegetable oil is being used as a vehicle for therapeutic drugs, a delayed reaction can act as a warning of the possibility of unpleasant and perhaps severe reactions occurring with further use of the particular oil.

The criteria for deciding, in this method of testing, whether a reaction is positive are difficult to fix. Zondek and Bromberg suggest that a red or rosy, slightly elevated papule, at least 0.5 cm. in diameter, at the site of injection, should be regarded as positive. Itching would act as a confirmatory sign. In most of the male cases in this series who gave positive reactions, these exceeded 0.5 cm. in size and ranged from 8 mm. to 34 mm. in

diameter. Itching at the site of reaction was present in two of the 24 cases reacting to one steroid only. It was felt that where the olive oil control reacted it might still be possible to distinguish a stronger reaction at the steroid tests. This comparison of reactions with a control in interpretation of the results is applied in other forms of skin testing, and if it is possible to obtain confirmatory information in other ways, a positive reaction may be registered. Such criteria would appear more satisfactory than an interpretation relying on arbitrary measurement and the exclusion of patients reacting to the vehicle from further testing. In addition to reactions coming on in 24-48 hours, the other types of reaction described by Zondek and Bromberg were observed. 'Recurrent' reactions were observed in two female cases and 'retarded' reactions occurred in three female cases, two of whom reacted with redness and itching at the original positively reacting site for three to four months at the time of the menses.

In the case of the 140 male subjects tested, corroborative information of a satisfactory nature is lacking, since the investigation in the males was intended only as a study of skin reactions to the steroids. In the case of the female patients, it was possible to obtain indirect evidence in the form of 'recurrent' and retarded reactions and most significantly, the occurrence of focal reactions, sometimes sharp in character, on injecting small doses of the suspected steroid. Even at this point, the possibility that any effects obtained were due to the hormonal effects of the steroids used cannot be discarded. This, however, is unlikely with doses of 0.01 to 0.1 mg. of the various steroids injected.

Six biopsy specimens were taken from areas reacting to the olive oil, steroid in oil and in saline. The changes seen in all cases were those of a non-specific inflammatory nature, consisting of perivascular round cell infiltration and a fibrillary appearance of the stratum corneum. In one specimen from a steroid reaction site there was some vacuolation of cells and a vesicle in the dermis associated with haemorrhage and necrosis. There was no eosinophilic infiltration in specimens from one-, two- and seven-day reacting areas. In view of the delayed type of reaction produced by this method of testing, the histological picture would not necessarily be that of an acute allergic reaction.

The olive oil vehicle, the technique of injection and the local effects of the steroids must influence the consideration given to positive skin reactions, especially where other information is lacking.

(To be concluded)

OUTLINE OF CONTRACT PRACTICE IN SOUTH AFRICA

C. A. H. GREEN, M.B., B.CH. (OXFORD), M.R.C.S. (ENG.), L.R.C.P. (LOND.)*

Johannesburg

1. MEDICAL AID SOCIETIES

Medical Aid Societies are formed primarily to assist contributing members to meet their expenses in connexion with illness. Originally such Societies functioned quite independently of any contract or arrangement with the Medical Association. The members of such Societies claimed a refund from their Society for their private medical expenses up to whatever amount was allowed by the rules of their particular Society. Quite a number of Medical Aid Societies function in this manner at present.

Approved Medical Aid Societies. The majority of the Medical Aid Societies function, however, as Approved Medical Aid Societies, i.e. approved by the Medical Association. Members of such Approved Medical Aid Societies are attended by doctors at a preferential rate in terms of the Tariff of Fees for Medical Aid Societies.

For a Medical Aid Society to be approved by the Association it has to undertake that the average salary of the members of the Society does not exceed £700 per annum and such Society must also guarantee the payment of the doctor's fees, provided accounts are rendered in terms of the Tariff of Fees for Medical Aid Societies. Any doctor has the right to contract out of this arrangement and charge private fees to members of Approved Medical Aid Societies, provided he informs the member of this. In such case the member and not the society is responsible for the payment of the fee.

The fundamental principles of Medical Aid Practice are a free choice of doctor for the member and payment for services rendered for the doctor. The majority of the members of the Medical Association are undoubtedly in favour of encouraging this form of practice.

Present Relation of Approved Medical Aid Societies with the Medical Association. The present Tariff of Fees for Medical Aid Societies is in force until 1 July 1951. All Groups and Branches of the Association have been asked to submit amendments to this tariff. In the light of these recommendations, negotiations will shortly take place with representatives of the Societies for an amended Tariff.

2. MEDICAL OR SICK BENEFIT SOCIETIES

These are formed by members contributing to a fund for the purpose of employing doctors either on a full-time or part-time basis to attend to sick members, to pay for medicines prescribed by such doctors, and to provide sick pay. Doctors are remunerated on either a capitation fee or salaried basis and have to carry out their duties in terms of the rules and regulations of the Society. To this extent they are under the control of the Society. Many Benefit Societies restrict their benefits to consulting room

* Chairman, Central Committee for Contract Practice, Medical Association of South Africa.

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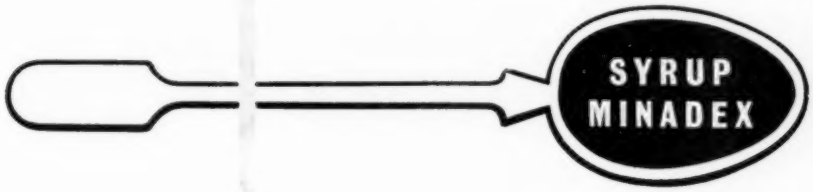

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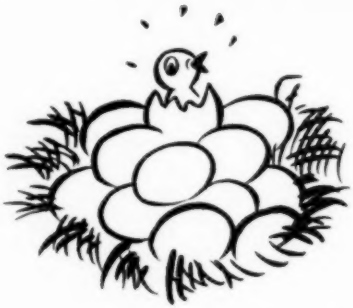

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and domiciliary attendance by general practitioners. Other Societies allow only a restricted specialist service. Those Benefit Societies which give a full medical service, including hospitalization and all specialist services, usually appoint specialists on a salaried scale. No practitioner may accept an appointment to a Benefit Society which has not been advertised in the medical and the lay press, and must obtain a written contract embodying terms of remuneration, duties, etc., in terms of Rule 19 of the South African Medical and Dental Council's *Rules Regarding Conduct*.

Approved Sick Benefit Societies. Although there is good reason to believe that many doctors accept appointments to Benefit Societies which have not been advertised (and in doing so are breaking the law), thanks to the rule of the Medical Council, the Medical Association is afforded some check on Benefit Societies. When an appointment is advertised it is possible for the Association to make enquiries regarding the income group of the members of such Society, the number of members, the number of doctors to be appointed and their remuneration. Should these not conform with certain standards laid down by the Association, the Society is requested to make the necessary alterations to conform to these standards. As a general rule the Societies agree to do so and are then approved by the Medical Association. No Benefit Society is approved by the Association unless its membership is confined to those earning less than £300 per annum with no dependants, and less than £600 per annum with dependants. Under certain conditions laid down by Federal Council, local Branch Councils may approve of Societies where a certain proportion of the membership is above this income group. The Association favours a panel of doctors instead of single appointments, with as wide a choice of doctor as possible.

The rate of payment to panel doctors should be not less than 22s. 6d. per annum per capita, or 70s. per annum per member with dependants.

Should a Benefit Society make provision for specialist services for its members, such Society may either appoint specialists on a salary basis, in conformity with a scale which has been agreed upon by the Medical Association, or may operate on the Tariff of Fees for Medical Aid Societies.

Relationship of Medical Benefit Societies with the Medical Association. Except for a few Benefit Societies of recent formation, very few Sick Benefit Societies conform with the standards laid down by the Association. The Railway Sick Fund pays a capitation fee of less than 12s. per annum plus certain perquisites instead of 22s. 6d. per annum, in spite of the fact that negotiations have been carried on for a considerable time to raise the rate of payment.

At present the Mines Benefit Society pays a membership rate of 54s. per annum instead of 70s. as laid down by the Association. Attempts are being made to negotiate with the Society for an increase.

As far as specialists appointed on a salaried basis are concerned, the position is even worse. The majority of the specialists on the Mines Benefit Society are being remunerated at a rate which is less than half, and frequently one-third of the rate suggested by the Association, and members would be shocked if they realized what rate of remuneration they get compared with what they would get in terms of the Tariff of Fees for Medical Aid Societies. Although individual steps have been taken to improve matters, to the best of my knowledge no steps as yet have been taken either by the Specialist Groups or the Association to negotiate with the Mines Benefit Society in connexion with specialist remuneration.

As far as Benefit Societies in general are concerned, the time is not very far distant when it may be necessary for the Medical Association to bring to their notice very forcibly that without the goodwill and co-operation of the doctors no Sick Benefit Society can function. In this respect the recent formation of the *Association of Benefit Societies* may be a good thing in that there is now a body with which the Medical Association can negotiate.

3. INDUSTRIAL AND COMMERCIAL APPOINTMENTS

It is becoming increasingly common for industrial and commercial concerns to appoint doctors, either in a full- or part-time capacity. Although Rule 19 of the S.A. Medical Council's *Rules Regarding Conduct* applies to this type of appointment, more often than not appointments are made without any advertisement, and not infrequently it is a case of 'jobs for pals'. In this type of appointment the company is responsible for remunerating the doctor, and the employees do not contribute.

Part-time Appointments. Where the duties involve routine attendances for periodic examination and check-up, periodic inspection, etc., the Association has laid down the principle that remuneration should be on a sessional basis at the rate of £2 2s. per hour or part thereof. When, however, the duties involve attendance on sick employees, remuneration for such work should be on the basis of the capitation fee applicable to Benefit Societies. Attendance on injured-on-duty cases should not, in the opinion of the Association, be included in the duties of the appointed medical officer except to render first-aid in an emergency, and then he should be remunerated for such service in terms of the Tariff of Fees under the Workmen's Compensation Act.

Whole-time Appointments. Some 20-odd years ago the Mines did away with part-time medical officers for their native employees and instituted a whole-time service. Although this change-over was chiefly brought about as a result of legislation in connexion with miners' phthisis, it has undoubtedly proved in every respect a very economical and efficient medical service. Other whole-time appointments that are likely to become increasingly common are in the nature of specialists in industrial medicine.

4. HOSPITAL APPOINTMENTS

Last but not least we come to appointments, whole-time and part-time, to hospitals, which of course, since the implementation of the Provincial Hospitals Ordinance, looms very largely in Contract Practice with far-reaching repercussions on the profession.

MEDICO-LEGAL SECTION

THE MEDICO-LEGAL ASPECTS OF INTERFERENCE WITH DEAD BODIES*

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Dissections, including autopsies, of dead bodies may be lawful or unlawful. A medical practitioner in South Africa who unlawfully interferes with the dead body of a human being may, it would appear, lay himself open to both a criminal charge and a civil claim for damages.

A medical practitioner may be said to *interfere* (either lawfully or unlawfully) with a dead body when he performs any of the following acts:—

(*a*) Holds a post-mortem examination (autopsy);
(*b*) Dissects a dead body [1];
(*c*) Removes any parts from a cadaver, as, e.g.,
  i. Cartilage or eyeballs for use on the living.
  ii. Anatomical specimens for a medical museum.
  iii. Under the provisions of the Anatomy Act.[2]
(*d*) Uses a dead body for the purpose of obtaining practice in surgery.

UNLAWFUL INTERFERENCE WITH A DEAD BODY

Criminal Law. The common law punishes as a criminal offence the unlawful violation or despoilment of a dead body.[3]

It is submitted that whenever a dead body is dissected it is 'violated or despoiled'.[4] The violation or despoilment may be made lawful by some statute; if it is not, then the fact that the dissection was performed, not with the desire to violate or despoil the body, but with some other motive (possibly a laudable motive, e.g., removal of an eyeball for use on the living), will not alter the criminal character of the act.[5]

The case of *Rex* versus *Kunene and Mazibuko* [6] would appear to offer support for this submission. The accused, who had for medical purposes excised and removed some part of the dead body, which they discovered in a river, of a man who had been drowned, were convicted of the common law crime of despoiling or violating a dead body. The Court appears to have accepted that the part was removed for medicinal purposes and that, therefore, there was no desire to violate or despoil the body, but nevertheless found the accused guilty of the crime with which they were charged.

Apart from the common law, Section 12 of the Anatomy Act makes it a criminal offence for any person to dissect for anatomical examination any dead body *otherwise than in accordance with the provisions of that Act.*

The same section provides that any superintendent or other officer in charge of a public institution or public officer having charge of a dead body under the Act, or any superintendent of an authorized School of Anatomy who knowingly allows the dissection of any dead body, otherwise than in accordance with the provisions of the Act, shall be guilty of a criminal offence.[7]

Civil Law. No civil action has, as far as the writers are aware, been brought in our Courts to recover damages for the unlawful interference with a dead body. For such an action to succeed the plaintiff would be required to prove:

(*a*) A wrongful act on the part of the defendant, constituting
(*b*) An interference with the exercise of a right by the plaintiff.[8]

Regarding (*a*), it is submitted that any interference with a dead body which is not authorized by statute is a wrongful act; while to detain or to interfere with a dead body would be an interference with the right which, it is submitted, a relative [9] has to obtain immediate possession of the body, as it was at death, for the purpose of burial.

1. 'Dissection' is here used with the meaning assigned to the word in the Anatomy Act, viz., 'for the purpose of teaching anatomy, medicine, surgery or any branch of art or science'. (Act 32 of 1911).

2. See section 7 (e) of Act 32 of 1911.

3. Gardiner and Lansdown: *South African Criminal Law and Procedure*, 5th ed., Vol. 2, p. 1156. See authorities quoted there.

4. Carpsovius in *Practica Nov. Saxonica Rerum Criminalium* (2, 83, 64-65) uses the words 'spoliant atque violant'. Cassell's *Latin Dictionary* defines the verb 'violo' as 'to treat with violence, injure'; while one of the meanings given to the word in Littleton's *Latin Dictionary* is 'to cut'. Pothier, *Ad Pand.*, 47, 12, 3, gives as examples the following ways in which a grave may be 'violated', viz., by effacing the inscription, by turning a statue round or over, by removing any part from a grave.

5. Gardiner and Lansdown, *South African Criminal Law and Procedure*, 5th ed., p. 1155. In the English case of *Rex* versus *Sharpe* (D. and B. 160; 26 L.J. M.C. 41) the accused was charged with unlawfully and indecently opening a grave and removing the body of his mother. The Court held that 'although fully sensible of the estimable motives on which the defendant acted, namely filial affection and religious duty, still neither authority nor principle would justify the position that the wrongful removal of a corpse was no misdemeanour if the motive of the act deserved approbation. A purpose of anatomical science would fall within that category. Neither does our law recognize the right of any one child to the corpse of its parent. . . .'

6. 1918 Natal N.H.J/S. para. 321.

7. The penalty provided is a fine not exceeding £50, or in default of payment, imprisonment with or without hard labour for a period not exceeding three months.

8. McKerron's *The Law of Delict*, 3rd ed., p. 64. See, too, de Villiers' *The Roman and Roman-Dutch Law of Injuries*, 1899 ed., at p. 14.

9. It is not clear, as is noted later, which relative would be entitled to bring the action. Sec. 5 (1) of Act 32 of 1911 gives the right to claim a body for burial to a relative or *bona fide* friend. See also sec. 55 of Act 47 of 1946.

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In Scotland in the case of *Pollok* versus *Dr. Workman* [10] the opinion was given that 'the cutting up or dissection, or other unauthorized mutilation of a near relative's body, constitutes a wrong of which a near relative has a title to complain', and that 'an unauthorized post-mortem examination is a relevant ground for a near relative of the deceased to claim *solatium*'.

In the United States of America the various state courts have on numerous occasions recognized the right of a relative to claim damages from a medical practitioner who has conducted an unlawful autopsy. It has been held that the wrongful dissection of a dead body is regarded as a wilful and intentional wrong against the person entitled to possession and control of a dead body for burial, and recovery may be had for mental anguish resulting from such a mutilation. The decided cases generally treat the unlawful dissection as an interference with a legal right. The legal right is the right to have immediate possession of the body in its condition at the time of death, and control for burial.' [11]

LAWFUL INTERFERENCE WITH A DEAD BODY

The medical practitioner who lawfully interferes with a dead body is, of course, protected from either a criminal prosecution or a civil claim.

Lawful Post-mortem Examinations (Autopsies). There are several statutes which either require or make lawful the holding of post-mortem examinations.[12] In each case an authority, specified in the statute, is required to order the holding of the examination or to grant permission for it to be held. It seems doubtful whether a post-mortem examination not authorized by statute can ever be lawfully performed.

This raises the question whether a medical practitioner would be acting unlawfully if:—

(*a*) He conducted a post-mortem examination on the dead body of a person who had before his death (e.g., by will) authorized or instructed that such examination be held;

(*b*) He obtained the prior consent of the nearest relative to the holding of the examination.

The answer would appear to be that in both cases the medical practitioner would be acting unlawfully.

This statement should, in the absence of express South African authority, be qualified by noting that a modern court would be disposed, if it could, to absolve from any criminal liability a medical practitioner who had removed, say, an eyeball from a corpse when:

i. The deceased's will expressly allowed this; and
ii. The immediate relations of the deceased consented.

There is also the fact to be considered that interference with a corpse, in the interests of science, is not necessarily

10. *Pollok* versus *Workman* (1900, 2 F. 354). See too the case of *Huges* versus *Robertson* (1913, S.C. 394).

11. *McPosey* versus *Sisters of the Sorrowful Mother et al.* (Okla.), 57 P. (2d) 617. For the report of other cases brought on the ground of an unlawful autopsy see *Gurganious* versus *Simpson* (N.C.) 197 S.E. 163; *Aetna Casualty and Surety Co.* versus *Love* (Texas) 121 S.W. (2d); 986; *Hemrich* versus *Aetna Life Assurance Co.* (Wash.) 63 P. (2d) 432. All these cases are reported in *Medicolegal Cases—Abstracts of Court Decisions* 1936–1940 (American Medical Association, Chicago, 1942).

12. (a) *Inquest Act* (No. 12 of 1919). The magistrate may order the district surgeon or some other medical practitioner to hold a post-mortem examination on the body of any person who has died from violence, criminal neglect, or otherwise than from natural causes, or is supposed or suspected to have so died (Section 2).

(b) *Criminal Procedure and Evidence Act* (No. 31 of 1917). In cases of homicide it is the duty of the person charged with the prosecution, or the Magistrate who conducts the preparatory examination, to order a medical practitioner, or some other person, to hold a post-mortem examination of the dead body (Section 87).

(c) *Public Health Act* (No. 36 of 1919). The magistrate or any Health Officer of the Department of Public Health may order a post-mortem examination to be made by a medical practitioner on the body of a person suspected of having died of an infectious disease, where the facts relating to the death cannot with certainty be ascertained without such examination, or where it is desirable that, for preventing the occurrence or spread of an infectious disease, the facts relating to the death should be ascertained (Section 34).

(d) *Prisons and Reformatories Act* (No. 13 of 1911). It is the duty of the magistrate to require from the medical officer of a convict prison, or from some qualified medical practitioner, a certificate showing the cause of death of every convict who may have died at a prison whether from natural causes, violence, or sentence of a court of law (Section 92).

(e) *Anatomy Act* (No. 32 of 1911). With the consent of the Inspector of Anatomy, the superintendent, or other officer in charge of a public institution, may hold or permit the holding of a post-mortem examination upon the bodies of the following persons: (i) paupers who at the time of their deaths were maintained by the Union or any Provincial Government and (ii) inmates of a public institution; *provided such bodies have not been buried within 24 hours after death, or have not been claimed for burial by a relative or* bona fide *friend within the said time.* The Inspector of Anatomy may only give his consent if he is satisfied that the holding of the post-mortem examination is desirable from a scientific or medical point of view—Section 5 (3) (*bis*).

(f) *Silicosis Act* (No. 47 of 1946). The Chairman of the Silicosis Medical Bureau may instruct a district surgeon or other specified medical officer to remove and forward to the Bureau the respiratory organs from the body of a person who was a miner or Native labourer (as defined in the Act). Where a medical practitioner has opened the body of a deceased person whom he believes to be a miner or a Native labourer, he is required to preserve the respiratory organs and advise the Chairman of the Bureau that he has done so. *If the medical practitioner is able to consult the widow (if any) or any adult near relative of the deceased,* he shall not act as provided above unless the widow or relative has consented thereto (Section 55).

(g) *Medical, Dental and Pharmacy Act* (No. 13 of 1928). The death of a person whilst under the influence of a general anaesthetic or local anaesthetic, or of which the administration of an anaesthetic has been a contributory cause, shall not be deemed to be a death from natural causes within the meaning of the Inquests Act, 1919 (Act No. 12 of 1919), or the Births, Marriages and Deaths Registration Act, 1923 (Act No. 17 of 1923), or any amendment of these Acts (Section 86).

(h) *Births, Marriages and Deaths Registration Act* (No. 17 of 1923). The magistrate on receipt of any such report as is referred to in section *twenty, twenty-two* or *twenty-three* shall instruct the district surgeon or other medical practitioner to investigate the cause of death, and if, in the opinion of the district surgeon or other medical practitioner death occurred from natural causes, the magistrate shall give an order authorizing burial and shall communicate the opinion of the district surgeon or other medical practitioner to the district registrar or assistant district registrar (Section 24).

(i) *Cremation Regulations* (Published in Cape Provincial Official Gazette No. 1054, dated 15 October 1926). The Medical Referee is, in terms of the regulations, entitled to order that a post-mortem examination be held by a medical practitioner expert in pathology, appointed by the Cremation Authorities, on the body of a person whose death might be due to poison, to violence, to any illegal operation or to privation—regulation 12 (5). This regulation is probably *ultra vires.*

and absolutely a *mala in se* in that our statutes recognize (true, for limited purposes only) that it may be done.

A corpse being *res nullius*[13] and incapable of ownership[14] does not form part of a deceased person's estate, and therefore it is impossible that by will or any other instrument the body can be disposed of. Any directions on the matter that the deceased may have given are consequently not binding on his representatives. There are, as will be noted later, statutory provisions enabling a person to give effective instructions with regard to the anatomical examination of his body after his death, and the cremation of the remains of a person known to have left written directions to the contrary is forbidden.[15]

Moreover, if what a testator has wished in his testament is contrary to law, it is not valid, 'for what the law reprobates, the testator, it would seem, cannot approbate'.[16] Inasmuch, therefore, as the law prohibits the violation or despoilment of a dead body, the testator cannot authorize that his dead body be treated in that way.

Where the medical practitioner obtains the consent of, say, the widow to the holding of a post-mortem examination, it may be assumed that he would have a complete answer to any civil claim for damages that she might subsequently institute. Whether any other relative would, by the widow's consent, be debarred from instituting a similar action does not seem clear.

In the Scottish case of *Pollok* versus *Workman*[17] the opinion was expressed that 'the daughter of a person whose body has been treated in the manner alleged (i.e., unlawfully dissected) may be entitled to *solatium*, i.e., damages in respect solely of injury to feelings. What the amount of *solatium* may be is a question affecting the *quantum* of damages. 'A relative who has had nothing to do with the deceased for many years and was not living with or near him may have little chance of obtaining any substantial award of damages.' This case decided that in the Scottish law a daughter is one of several persons who might have a title to sue for damages.

To avoid any possible civil claims a medical practitioner might consider it wise to obtain the consent of, if not all the relatives of the deceased, then the consent of all those most closely related to the deceased. Thus protected he might consider himself invulnerable; but he would be so only as far as the civil law is concerned. A post-mortem examination undertaken with the consent of the relatives, but not otherwise lawful, would, it is submitted, be a contravention of the criminal law.

For 'contrary to the rule in civil jurisprudence, which gives to one no compensation for an injury done from another's act to which he consented, in the criminal law private persons cannot license crime, and it is no excuse for a wrong-doer that he had anybody's permission'.[18] If, as has already been submitted, a body is violated or despoiled when a post-mortem examination is held on it, then no person can licence a medical practitioner to perform the examination; so that a post-mortem examination conducted with the consent of the relatives, but otherwise not lawful, would constitute a criminal offence.

Apart from the common law there is a clear statutory provision contained in section 12 of the Anatomy Act making it a criminal offence for any person to dissect for anatomical examination any body *otherwise than in accordance with the terms of the Act*. Nowhere does the Act provide that an examination performed with the consent of the relatives is lawful. It follows, therefore, that a medical practitioner who dissected a body otherwise than in accordance with the provisions of the Act would be committing a criminal offence, notwithstanding the fact that he had obtained the consent of the relatives.

Lawful Dissection of a Dead Body. The only statute which makes lawful the dissection[19] of a dead body apart from the statutes authorizing post-mortem examinations, is the Anatomy Act. Only certain bodies may, in terms of the Act, be used for dissection. These are:—

1. Paupers, who at the time of their death were maintained by the Union or any Provincial Government, and
2. Inmates of a public institution.[20]

These bodies only become available for dissection when they are:—

1. Not buried within 24 hours after death, or
2. Not claimed for burial by a relative or *bona fide* friend of the deceased within that time.

Furthermore, the dissection of these bodies may only be done at an authorized School of Anatomy, and then only when the bodies have been retained for 14 days after the date of receipt.

The only other bodies which may, in terms of the Act, be lawfully dissected are those which have by the last will of a deceased person been left to an authorized School of Anatomy.[21]

The Act requires that a dead body lawfully received by a School of Anatomy must be retained for a period of 14 days before it is dissected.[22] The only exception is the case of a dead body received by the School under the last will of a deceased person when dissection may be performed immediately.[23]

13. Gardiner and Lansdown: *South African Criminal Law and Procedure*, Vol. 2, 5th ed., p. 1156.

14. The same principle obtains in the English Law. In *Rex* versus *Sharpe* (Dears and B., 163), for example, it was held that: 'Our law recognizes no property in a corpse.' 'Though the heir has a property in the monuments and escutcheons of his ancestors, yet he has none in their bodies or ashes' (2 Bl. Com., 429). 'There can be no property in the human body, either living or dead.' I. Hawkins, P.C., 148 (n. 8).

For a statement of the law in Australia see the case of *Doodeward* versus *Spence* (1909 C.L.R. 406).

The Canadian court, in *Miner* versus *Canadian Pacific Rly. Co.* (1910, 15 W.L.R. 161) decided that: 'Inasmuch as there is a legal right of custody, control and disposition, the law recognizes property in a corpse, but property subject to a trust and limited in its right to such exercise as shall be in conformity with the duty out of which the right arises.'

15. See Section 5 (7) (a) of the Anatomy Act; and the Cape Cremation Regulations, published in Gazette No. 1054, dated 15 October 1926.

16. Sande: *Decisiones Frisicae*, 4.4.4. (de Vos' translation at p. 6).

17. *Supra*.

18. Bishop's *Criminal Law*, 8th ed., Vol. I, p. 139. See, too, Gardiner and Lansdown's *South African Criminal Law and Procedure*, 5th ed., Vol. I, p. 91.

19. Dissection, that is, 'for the purpose of teaching anatomy medicine, surgery, or any branch of art or science' (Anatomy Act).

20. 'Public institute', in terms of the Act, 'shall mean and include any public institute supported wholly or in part by funds received from the public revenues of the Union or any province' (Section 1).

21. Section 5 (7) (a) of the Anatomy Act.

22. Section 8 of the Anatomy Act.

23. Section 8 of the Anatomy Act, as amended by Section 4 of Act No. 3 of 1945.

Dead bodies lawfully received by a School of Anatomy may be used in the following manner:—

1. For anatomical dissection, i.e. for the teaching of anatomy;

2. For the teaching of medicine, surgery or any branch of art or science, which would probably include:

(*a*) Autopsies to study the nature, extent and distribution of disease;

(*b*) Practising of surgical operations;

(*c*) Acquiring the technique of performing autopsies.[24]

REMOVAL OF PARTS FROM A DEAD BODY

Recent advances in medical science have made it possible to use organs or tissues removed from the recently dead for the purpose of treating disease, e.g. portions of eyeballs to restore sight in certain types of blindness; rib cartilage for certain plastic surgical operations. There exists no statute authorizing the removal of any portion from a dead body for this purpose. The statutes which make lawful the holding of post-mortem examinations do not provide for the removal of any portion of the body for the treatment of disease.

The removal of, say, an eyeball from a dead body may, for the reasons previously discussed, constitute a violation or despoilment of a dead body. Thus in *Rex* versus *Kunene and Mazibuko*[6] the accused, who for medicinal purposes excised and removed some part of a dead body, were convicted of this common law offence.

If the submission that no person can license a medical practitioner to hold an autopsy on his body after death is a correct statement of the law, then it follows that no person can authorize a medical practitioner to remove a portion of his body after death, since in both cases the dissection would involve a violation or despoilment of the dead body; nor, as we have previously seen, would the consent of the relatives free the medical practitioner from a possible criminal prosecution.

While there is no statute which permits the removal of parts from a dead body for the treatment of disease, the Anatomy Act does authorize the removal and retention of such parts for demonstration or educational purposes when they have been obtained from bodies lawfully in the possession of a School of Anatomy.[25] To obtain parts from a dead body otherwise than in accordance with the Anatomy Act would be a contravention of the law.

Higgins, J., in the case of *Doodeward* versus *Spence*,[26] which came before the Australian High Court, remarked in the course of his judgment that: 'Many of the pathological and other specimens exhibited in medical museums—growths, limbs, etc., have been taken away after an operation by the surgeon with the consent expressed or implied, of the living patient, who is only too glad to be rid of his troubles. But I rather think that sundry contraventions of the strict law as to dead bodies are winked at in the interests of medical science, and also for the practical reasons that no one can identify the bones or parts, and that no one is interested in putting the law in motion. Probably some amendment to the Anatomy Act may be required to meet modern conditions. But subject to such regulations as Parliament may frame in the interests of science, all considerations—whether of the public health or of decency or of religion—seem to point to the importance of maintaining the long-standing British law, to the effect that the only lawful possessor of a dead body is the earth . . .'.

PRACTISING OF SURGERY ON A DEAD BODY

The practising of surgery on a cadaver may only lawfully be done at an authorized School of Anatomy, and then only on those bodies lawfully received by the School in terms of the Anatomy Act. A medical practitioner entrusted with the duty of performing a post-mortem examination in terms of a statute, would probably be committing a criminal offence if he permitted any person to practise a surgical operation on such a dead body.

24. To satisfy the South African Medical and Dental Council's requirements.

25. Section 7 (e) of the Anatomy Act.

26. 1909 C.L.R. 406, at p. 423.

VERENIGINGSNUUS : ASSOCIATION NEWS

MINUTES OF THE ANNUAL GENERAL MEETING OF THE BORDER BRANCH, HELD AT THE WINDSOR HOTEL, EAST LONDON, ON 3 FEBRUARY 1951, AT 6 P.M.

Present: Drs. Waddell (*President*), Schaffer (*President-elect*), Norman, Jaffit, Holmes, Sheppard, Cunard, Gutsche, Swift, Lalor, Navid, Whiteside-Robertson, Wagner, H. Louw, Stevenson, Meine, D. W. Burton, Segall, Alexander (*Acting Secretary*).

Apologies were received from Drs. Remzi-Bey, Hankins, Dauth, Cheyne, Bokwe, van Schalkwyk, Doran, Berchowitz, Pringle, Cooper, A. W. Burton, Hay-Michel, Taylor, Lauckner, Paisley.

The President opened the meeting by proposing that a letter of greetings and good wishes be sent to Dr. Pollok. He then asked the members to rise as a token of respect in memory of Dr. Cummings, Dr. Ferguson and Dr. Hill, who had passed away during the year.

President's Valedictory Address: Dr. Waddell said that during the year certain events stood out in strong contrast to previous years. He praised the Queenstown Division for organizing an excellent clinical meeting and dinner at which there was a record attendance. He had accepted an invitation to attend a meeting at Glen Grey. Locally there had been a stimulating educational meeting by Dr. Dormer in East London. He had visited the Kingwilliamstown Division to try and stimulate interest there, and hoped that this would eventuate in good results this year. A big honour had been conferred on Dr. Fismer in his election as Honorary Member of the Medical Association of South Africa. This was also a big honour to the Border Branch. Membership had increased to 95% and, without Interns, to 92%. Beyond that there was little to stimulate interest. During his office he attended the largest meeting ever held in Queenstown, and the smallest in East London, when it was necessary to go to places of entertainment to ask members to come in order to form a quorum. A large majority had failed to afford the courtesy of an apology for failing to attend meetings. Ours is a profession, not a trade, yet it is significant that it is only on occasions when the question of a greater remuneration for our work is to be discussed that a lively interest is shown. Interest in the affairs of the Branch had reached a very low level, and he did not think we could show less interest, and he appealed to all to remedy this state of affairs. His year as President of

the Branch had proved to be a great disappointment as a result of our apathy. He congratulated Dr. Schaffer, the new President, and wished him good luck, and asked the members to give him their support.

He wished to commend the Local Branch on its local Women's Association, and their Sports Association, and hoped that these activities would spread to other Branches. Dr. Waddell proposed that a message be sent to the wives of the doctors of the Local Branch, expressing the appreciation of this meeting for the useful work they are doing.

Dr. Waddell next inducted Dr. Schaffer as the new President for the ensuing year. Dr. Schaffer thanked the meeting for the honour they had bestowed on him and thanked Dr. Waddell for what he had done for the Branch. Dr. Waddell had added lustre to this Chair and the Divisions had benefited considerably from his efforts. Dr. Waddell would go down in the annals of history as being one of the most successful Presidents. He stated that Federal Council should subsidize Branches so that each Branch could have a properly organized Branch office with a full-time secretary, which could also be a branch of the Medical Association Agency.

Election of Office-bearers:

1. *President-elect*: Dr. P. Wagner.
2. *Vice-President*: Dr. Norman.
3. *Honorary Secretary-Treasurer*: Dr. L. L. Alexander was elected in the place of Dr. H. V. Hankins, who sent in a letter of resignation.
4. *Auditors*: McGillewie (Mr. V. Martin).
5. *Branch Council Members*: Drs. Norman, Jaffit, Smyth, Alabaster, Lewis, Norton, Adendorf, E. Louw, van Schalkwyk, Gardiner.

A vote of thanks was passed to Dr. Hankins for his valuable assistance rendered to the Branch, and to Mr. Martin and Mrs. Hogg for the work they have done for the Branch.

Report from Representatives from Last Federal Council:

(a) Dr. Schaffer as the member present referred to a few matters, as follows: 10% *Reduction of Medical Aid Societies' Fees*. This had been granted by Federal Council for one year; 5 February had been set aside for a joint meeting between the Contract Committee and the Medical Aid Societies.

(b) Vacancy due to expiration of Dr. Luke's term. Port Elizabeth nominee supported and approval asked for this action. *Granted.*

(c) Notification of amoebiasis placed before the Government.

(d) Relationship between Association and Provinces as regards Hospitalization. There must be election of officers for each hospital by all members practising in the area who have sent patients to hospital. Not less than 50% of the Honorary Staff shall be members of the hospital.

Dr. Wagner stated that Dr. Schaffer had the honour to be elected a member of the Federal Council Executive and congratulated him and the Border Branch.

Correspondence:

A letter was read from Dr. Fismer expressing his thanks for being recommended as Honorary Member to Federal Council by the Border Branch. Agreed that a letter be sent to Dr. Fismer regretting his absence due to illness and wishing him a speedy convalescence.

A letter from Dr. Tonkin *re* name of successor to Dr. Macvicar, who had resigned from Alice War Memorial Hospital Board. Referred to Branch Council.

An invitation was received from the National Cancer Association of South Africa asking us to send representatives to the conference on 12 to 13 July 1951 to consider ways and means of tackling the increasing problem of cancer in South Africa and asking for suggestions to be included in the agenda.

Circular *re* alteration to bye-laws regarding election of Association President. This Branch is in favour of suggested changes in laws.

Any Other Business:

Dr. Meine proposed and Dr. Schaffer seconded that this Board be given more power in control of Hospital Boards. Dr. Louw asked that they should have more spending power of their own money, and that this be incorporated in the motion. *Carried.*

Medical Benefits. Dr. Segall asked whether the Branches were autonomous in the 10% reduction demanded by the Medical Benefit Societies. Dr. Schaffer stated that in certain measures this was so, but the question was being reconsidered. The wage-earner has free choice of his doctor and his account is paid by the Society. We should not interfere with this.

Dr. Meine asked when the three years were up whether our Association had any programme as regards appointments to hospitals. Had the Provincial authorities anything up their sleeves to spring upon us? *Reply from the Chair*: Federal Council has taken a resolution that this Association is in favour of the Honorary system being retained. Honorarium will now be on the basis of £10 per annum for occupied beds. No Honorary shall receive more than £100 in any one year. The object of the Federal Council at present is to do everything possible to retain the Honorary system. This is also the view of the Administration, as otherwise they will go bankrupt. Weaknesses in the Ordinance have to be amended, and straightened out. Dr. Schaffer stated that he had voted in favour of this and asked for the meeting's approval. *Granted unanimously.*

Dr. Waddell pressed for the notification of rubella. This was agreed upon and it was decided to refer it to Branch Council.

* * * *

MINUTES OF ORDINARY GENERAL MEETING OF THE QUEENSTOWN DIVISION HELD IN THE FRONTIER HOSPITAL ON 30 APRIL 1951

The meeting opened with the showing of a film on allergy. The matrons, nurses and staff of the Frontier were invited to attend.

Members Present: Drs. Bosman, Edelstein, Holmes, Kunz, Katz, Louw, Maartens, Paisley, Papilsky, Rosin, Schaffer, Schweitzer, Tochar, Vellama, Voortman, Wolpowitz, J. van Schalkwyk, M. van Schalkwyk.

The Chairman (Dr. Schaffer) welcomed Dr. Vellama transferred from the Central Division (O.F.S.), and Dr. J. Katz from London, an affiliated member.

Nomination of Member to Frontier Hospital Board: Three nominations: Drs. Voortman, Gardiner and Louw. Voting by ballot: Dr. Voortman nominated.

New Members: Drs. H. Smit, Vellama, Katz, Rosin.

Apology for Absence: Dr. Simonsz.

Passing of Dr. Swemmer: The members stood in silence as a token of their esteem.

Arising out of the Minutes: Alteration in bye-law 'that the member elected to the office of Vice-President at the Annual General Meeting be President-Elect'. Proposed by Dr. Schaffer, seconded by Dr. Louw. *Agreed.* Dr. J. van Schalkwyk President-Elect.

General: In response to a query by Dr. Louw about the use and control of the film projector, Dr. Schaffer explained that at present there was no Committee controlling the film projector; but the Adult Education Committee would shortly be revived.

Dr. J. van Schalkwyk asked about the Bill to be introduced by Dr. Bremer in Parliament. Dr. Schaffer lucidly explained that it is an amendment to the existing Medical, Dental and Pharmacy Act whereby the Medical Council would act in an advisory capacity *re* overcharging by medical men. Dr. Louw thought that the Medical Council should lay down a fixed tariff.

Correspondence: Letter *re* combined meeting of Border and Transkei Branches: Dr. Schaffer promised he would suggest a central town accessible to the Queenstown members.

Next Meeting: Dr. Katz kindly agreed to give a paper on some aspect of child psychology, and the present interns would kindly show clinical cases.

Tea was served and the meeting ended at 10.20 p.m.

RADIOLOGICAL SOCIETY OF SOUTH AFRICA

The Council of the Radiological Society of South Africa met in Johannesburg on 23 January 1951.

Present: Prof. S. F. Oosthuizen, Chairman, and Drs. Jackson, McLachlan, Nel and Weinbren.

It was noted that a proposed new Medical Aid Tariff for X-ray fees had been drawn up by a special Sub-Comittee of Transvaal members and submitted to the Central Committee for Contract Practice. The other Branches of the Society should be asked to submit any amendments to the proposed tariff.

The Secretary was instructed to write to the President of the Faculty of Radiologists, England, thanking him for the honour conferred on South African Radiology by making Professor Oosthuizen an Honorary Fellow of the Faculty of Radiologists.

The Secretary read out a summary of replies of radiologists to the Medical Council's questionnaire on the registration of Specialists as applied to Radiologists. The meeting supported the opinions disclosed by the questionnaire, viz.:

(*a*) That the two years' general practice clause should be abolished, special concessions being given to ex-servicemen.

(*b*) That the one year's surgery should read 'six months' surgery, plus six months' medicine'.

(*c*) That no different regulations were required for radiological diagnosis as opposed to radio-therapy.

(*d*) Apart from these proposals the regulations should stand as at present.

F. W. McLachlan,
Honorary Secretary.

206, Van Riebeek Medical Building,
Schoeman Street,
Pretoria.

SOUTH AFRICAN MEDICAL AND DENTAL COUNCIL

NOTES ON A DISCUSSION ENTITLED: THE RESPONSIBILITIES OF THE PHYSICIAN A PROBLEM OF MEDICAL EDUCATION

The subjoined remarks might be of some interest as showing the type of thinking that is going on at present in United States medical circles (November 1950):

Dr. Olson: The distinguished panel which has accepted the invitation of the Department of Medicine to discuss one particular phase of medical education lends weight to the importance of the topic: *The Responsibilities of the Physician*. I am happy to introduce to you our guests—Dr. Anderson, Dr. Armstrong, Dr. Hoffman, Dr. Manlove, Dean Ryan, and Dean Sheehan. They represent the medical schools of the West Side Medical Centre, the Cook County and Presbyterian Hospitals which are an integral part of our teaching schedule, and of the Council on Education and Hospitals of the American Medical Association.

I am hopeful that we can reach some definite conclusions in spite of the limited time which is available to us. First, some of my own ideas on the problem which we are about to discuss. It seems to me that the responsibilities of the physician must be divided into:

1. His responsibility towards the profession as a whole:
2. His personal responsibility which extends to the patient as well as to himself and his own conscience.

The professions, as a whole, can set up standards of technical skill as well as standards of conduct. The relative importance of skill *vs.* conduct varies in the several professions. A clergyman, for instance, has little technical skill but assumes a great deal of personal responsibility, while a civil engineer can work with a great deal of technical skill applied effectively in a detached and impersonal manner. Unlike these extremes, the physician must live up to both. In spite of the recognition of this fact, the emphasis of medical education, at this time, rests on skill and facts, and one wonders often whether we prepare our students adequately for the requirements of their profession. I feel strongly that one cannot divorce scientific accomplishments of medicine from the ethical principles under which they are practised. In an emergency, for instance, a physician must act rapidly or, as we like to say, 'instinctively'. Naturally, this 'instinct' is a combination of both sound medical training and emotional conditioning—the 'responsible physician' must fulfil this dual requirement. I would like to return to the problem of the responsibility of the profession as a whole. Dr. Anderson, how do you feel that the standards set down by organized medicine, the American Medical Association to be specific, might influence the teaching of personal responsibility in our medical schools?

Dr. Anderson: The non-scientific responsibilities of the medical profession were well outlined by Roscoe Pound in the *New England Journal of Medicine* of 8 September 1949. I should like to quote parts of this article directly: 'Let me repeat what we mean by the term profession when we speak of the old recognized professions. We mean an organized calling in which men pursue a learned art and are united in the pursuit of it as a public service—as I have said, no less a public service because they make a livelihood thereby. Here, from the professional standpoint there are three essential ideas—organization, learning and a spirit of public service . . .

'The trade association exists for the purposes of the trade as a money-making activity. The medical society exists primarily for the purposes of medicine, not of the doctor of medicine, and for the advancement of the healing art . . . What medical associations have done for advancement of medicine I need not recount to you.'

I am certatin that many of medicine's accomplishments have been possible only because physicians have worked in organized groups. As individuals they would have been unable to advance the art of medicine as effectively and in the public interest. For example, in groups physicians have established acceptable standards for undergraduate medical education. They have improved the intern and resident training and the standards of hospitals. They have stimulated the legislatures to promote health departments, to regulate the traffic in foods and drugs, etc. Much more must be done, it is true. In our educational programmes, we should emphasize the responsibility of our students to the society in which they live. Many students are critical of the activities of organized medicine. I suspect much of this distrust arises from lack of proper interest in the activities of medical societies on the part of many teachers.

Dr. Ryan: The current attempts to organize a *Student American Medical Association* seems to make possible an important step towards the goal outlined by Dr. Anderson. The students would be represented at the meetings of the *American Medical Association*—they plan to have a journal of their own, a development which would emphasize to the student that he is already a part of the profession and as such, has an obligation which he must assume. Such groups who have already begun to develop their own school programmes would seem to provide an excellent channel through which the student could be indoctrinated in his formative years in the responsibilities, obligations and ethics of the medical profession. Dr. Cole has had much more responsibility than I have in the promotion of these efforts locally and I wonder whether he would care to comment on the programme.

Dr. Warren Cole: The student does not get close to the problems of organized medicine until late in his career as a physician. This interest should be stimulated at a younger age—the only way that this can be done is the inclusion of the student in the activities of organized medicine. The *Student American Medical Association* might well be the answer to some of these problems. You must be careful, however, to maintains a balance so that the students' activities are neither too independent nor stifled by too much authority from the parent organization.

Dean Olson: The speakers thus far have given us their opinion as to how the professional responsibilities of the medical students can be developed by professional organization. I should like to call on Dr. Armstrong to outline his prescription for the education in personal responsibility of the junior medical student at a time when he first comes in contact with patients.

Dr. Armstrong: In a teaching hospital, I feel this can be best done by giving the student the feeling that he is an integral part of the team caring for the patient. This team should consist of attending man, resident, intern and student, all working towards one common purpose and all sharing some of the responsibility. This is not correlated with the type of bed, private or public, but rather with the type of individual who heads the service. He sets the keynote for the type of co-operation which will be followed through in the management in the teaching hospital. In the old German medical schools there was the Geheimrat type of professor to whom all others on the staff were subordinate and made to feel so. In the German scheme teamwork was virtually unknown. The professor must have the time and the willingness to utilize his time in listening to his students and directing their thoughts, both scientifically and ethically. This type of teamwork is desirable, both in teaching and in practice.

Dr. Sheehan: I do not want to speak disparagingly of teamwork. However, in recent years the trend has been to emphasize scientific rather than character background in the selection of students. By the time an individual reaches medical school age, his personaliy is well crystallized. Therefore, one must choose applicants with the type of character thought to be desirable in a physician. This is not easy. In our institution we base this judgment on the testimony of men of discernment who have associatetd with the candidates. After the students have been admitted to this school, we teach the physician's moral obligation to the patient outright. It depends fundamentally on the individual's philosophy of life. In our thinking this should consist not only of honesty, integrity, and responsibility to Society as constituted but should embody a religious responsibility. Intellectual concepts alone are not sufficient motivation. Exposing the student to Christian moral concepts is no problem in our institution. We feel sure that most of our students in their professional lives will be motivated by these principles.

Dr. Manlove: At this point I would like to take up Dr. Sheehan's remarks on the proper selection of students. Character can be modified to a certain extent after the individual has been admitted to the medical school. I believe that we underestimate the problems which confront the student who faces the responsibilities of the profession. The Department of Psychiatry perhaps can help somewhat by giving the student insight into the physician-patient relationship, thus helping the doctor to bear the patient's wrath and to eliminate compulsiveness in medicine.

Dr. Hoffman: I cannot agree with Dr. Manlove's contention that character can be changed. When I think of the many students, interns and residents who have passed through our hospital in the former years, I have come to suspect that not much can be done once we get hold of the future physicians. Even at that early station in life a gentleman will behave like a gentleman, no matter what situation confronts him, and I suspect strongly that all our efforts will be in vain when we try to make a saint out of the scoundrel. I found that even for the best of us it must make some difference whether we examine the president of the Coca Cola Company or one of the unfortunate victims of circumstances who are brought to a large city hospital. I doubt very much that medical education can accomplish anything in this particular sphere of personal responsibility. Perhaps there should be a more thorough method of selecting students.

Dr. Keeton: It seems to me that this discussion of medical education has been slanted toward educating the medical student in honesty, integrity and courtesy. One must not forget that students arrive at the university after spending 14 years in school. This includes three or four years in college, in which they have associated with other students in the classroom, on the athletic field and in social events. By this time they have learned to show respect to their associates and have developed the habits of courtesy. Honesty and integrity are virtues with which the parents and children have been wrestling since birth.

At the school age the teachers take up the battle. It would, therefore, be highly unpedagogical to assume that medical students are ignorant in these fields. The problem therefore concerns instruction as to what is honesty and integrity in the field of medicine. It is unthinkable that a student previously known to be dishonest could be converted into an honest gentleman by taking a medical course.

Medical education is a continuing activity. The student begins his instruction in the medical school and continues it after graduation through post-graduate courses, programmes of his medical society and conferences of his hospital staffs. In the medical school his objective is the acquisition of knowledge and after graduation the practice of medicine. In this latter period he is concerned primarily with the application of his knowledge to the relief of suffering and to the provision of a livelihood, and only secondarily to the acquirement of further knowledge.

Medical knowledge consists of:

(a) Factual knowledge, the individual elements of which may be classified as building stones;

(b) Certain laws and conventions which can be best described as medical logic. Medical logic consists of the concepts and the partitions into which the facts are fitted together. It is easy to teach facts. But to teach the use of facts requires continuous evaluation on the part of medicine. This is an unending effort not terminated by the end of medical school.

In some people motivation toward the correct solution of medical problems is found in the great satisfaction of solving the problem, in the escape from the proddings of the pathologist's voice in the morgue . . . The acquirement of medical knowledge teaches honesty in medical matters.

During the period of medical education after graduation, Society or other factors may substitute counter-motivations which put a stress on honesty. He is not alone in this respect. Every professional man and, in fact, everybody must select for himself a brand of social behaviour. Indeed, the medical man is in a rather favoured position. He is a public servant and, as such, subjected to close scrutiny. If he does not apply his factual knowledge to the practice of good medicine, the community soon finds it out and he is branded a poor doctor. When he joins a hospital staff and a medical society he runs into rules to guide his ignorance and curbs to insure that he does not commit a crime in the field of medical reasoning and logic.

Dr. Hoffman: In other words, Dr. Keeton, the student must pass the judgment of his teachers. If the members of the staff are idealists and men of high character, the students will naturally emulate them and will thus follow the good life.

Dr. Olson: I am impressed by the term 'the good life' which Dr. Hoffman has selected. Again and again when a patient is selecting a physician he will ask: 'What kind of a doctor is he?' If all physicians were uniformly good this question would not arise. It seems to me we are forced to the conclusion that some physicians must practise in a manner which invites criticism. I can now state my original question in much simpler words. What can we do to educate *good* physicians?

Dr. Wakerlin: I believe that there are three areas in which we should encourage education to promote a greater sense of responsibility among medical students. First, the premedical curriculum should include more of the humanities. Second, in medical school a course on the 'art of medicine' should be inserted even at the expense of some of the medical sciences. This should include not only ethical concepts but some of the practical business principles for a medical practice. Third, we should teach by precept from the head of the department on down to the intern.

Dr. Olson: Dr. Wakerlin has expressed a thought which I believe is of the greatest significance, namely that teaching can only be as good as the teachers. We may summarize the discussion by saying that the panel has brought out clearly that the profession organized in effective groups has been able to promote standards for professional responsibility. The continuous effort of the medical schools to graduate students with personal responsibility, on the other hand, depends on the proper selection of students and, if I interpret the consensus of the panel correctly, on teaching by precept. In conclusion we can state with convictions that medical teaching is deficient unless the art of medicine becomes an integral part of the science of medicine.

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PASSING EVENTS : IN DIE VERBYGAAN

STUDENTS' CONFERENCE ON CANCER

The Students' Medical Council of the University of the Witwatersrand has arranged that its eighth Annual Medical Conference will be devoted to the subject of Cancer.

The Conference will be held at Medical House, Esselen Street, Johannesburg, from 8–12 June 1951. A very thorough programme has been compiled. Readers interested should communicate with the Conference Committee at the above address.

DR. AND MRS. A. W. S. SICHEL IN LONDON

On Tuesday evening, 12 June 1951, Dr. A. W. S. Sichel, President-Elect of the British Medical Association will meet the Officials of the British Medical Association and some of the leading members of the Council at a small dinner party. The Annual General Meeting will be held at 12.30 p.m. on Friday, 15 June. At this meeting Dr. Sichel will be installed as President and invested with his badge of office by the retiring President. After his installation, Dr. Sichel will take the Chair for the remainder of the meeting which is usually concerned with formal business.

On the evening of Friday, 15 June, the Adjourned Annual General Meeting will be held at the Central Hall, Westminster. The new President will first receive the overseas representatives and he will then present the various prizes which have been awarded by the British Medical Association during the past year. On this occasion he will also present the Gold Medal of the British Medical Association to Dr. Gregg.

After this ceremony, Dr. Sichel will deliver his Presidential Address. This will be followed by a reception which will also be held at the Central Hall, Westminster. It is at this meeting that Mrs. Sichel will be invested with the badge for the President's Lady.

TRIBUTE TO DR. A. HAY-MICHEL

In the *Farmer's Chronicle* and *Stutterheim Times* there is a two-column report of the celebration organized by the Cottage Hospital Ladies Auxiliary who were the hostesses to Cathcart and the District in the Hospital grounds on Wednesday, 25 April 1951 to celebrate the Hospital's 25th birthday and to pay tribute to Dr. A. Hay-Michel.

Dr. Hay-Michel was presented with a silver tray, inscribed 'In Appreciation of Many Years of Devoted Service to Cathcart and District', and with a cheque to which practically the entire community has subscribed.

Mrs. Hay-Michel was presented with a bouquet of flowers.

* * * *

Die Sekretaris van Gesondheid het 'n kennisgewing ontvang van die Gezantschap van België dat die XXV sitting van die *Geneeskundige Dagen* te Brussels gehou sal word vanaf 9 tot 13 Junie 1951. Mediese praktisyns wat belangstel kan verdere besonderhede skriftelik verkry van die Sekretaris-generaal der Geneeskundige Dagen, 141 Rue Belliard, Brussels, België.

REVIEWS OF BOOKS

THE CHORDATES

The Chordates. By Herbert W. Rand, Ph.D. (Pp. 862 + ix. With 609 figures. 45s.) London: H. K. Lewis & Co., Ltd. 1950.

Contents: 1. Prologue: Why Study Vertebrates? 2. Basic Structure of Vertebrates. 3. Comparative Anatomy—Its History, Aim and Method. 4. Comparative Morphology of Chordates. 5. Epilogue: What Comes of Studying Vertebrates?

As would be anticipated by anyone who knows the author's work, whatever he might produce would be expected to be first class, and the present volume thoroughly justifies the expectation.

The main body of the book might be described as 'Comparative Anatomy in Reverse', i.e. instead of taking an individual feature and following it throughout the whole range of the chordate phylum, a basic structure for all members is laid down, and the classes as a whole considered in their relation to this basic structure, with its modifications, adaptations, etc.

At the same time, a mass of collateral material is brought forward which adds great interest and widens its whole scope, so that a complete picture is presented, not only from a scientific, but also from a historical and philosophical point of view.

In support of a study of vertebrates, the author draws attention to what he calls the 'intuitive comparative anatomy' of even the primitive peoples in their mimicry of the different animal groups, strongly pointing to a variety of associations among these groups, including both structural and functional resemblances, especially among the chordates.

The basic structure is excellently portrayed. It is comprehensive and compact, and what variation there is in this respect is probably a gauge of the special interests of the author.

The history of the development of comparative anatomy is succinctly and pleasantly dealt with, from cave paintings through human anatomy, physiology, histology, and finally embryology, leading up to the theory of evolution, followed by a great burst of comparative anatomy proper.

The aim and method of comparative anatomy is covered by a short consideration of analogy and homology, and a readily understandable account of the hypotheses of parallelism, adaptive radiation and convergence. The criteria of homology are lucidly set forth, and of these embryonic origin is considered probably most important, but, says the author, 'its evidence is inevitably circumstantial and involves some large assumptions'.

In considering the comparative morphology of chordates, the author puts forward three objects, viz. to describe the major structural adaptations, to compare the more conspicuous and functionally important modifications and to classify the chordates in accordance with the principles already stated. As a result, some selectivity is indulged in, in favour of such features as are especially significant in achieving the objects aimed at. The whole is excellently set forth and a first-class comprehensive survey is produced, wonderfully complete and devoid of trimmings.

In his epilogue, 'What Comes of Studying Vertebrates?' the author gives a brief résumé of some of the amazing adaptational variations to suit environment, with, generally speaking, continuous progressive evolutionary development, in the establishment of which Anatomy, Embryology and Palaeontology all play their part.

The old hypotheses are considered, but many of their difficulties have not been solved to date, and they remain hypotheses.

Human evolution is essentially an evolution, in the author's opinion, not of organs, but of ideas, the vital change being the adaptation of the environment to suit the individual, as opposed to the adaptation of the individual to suit the environment, as in all lower forms. Such an evolution is vastly speedier than a structural one and it progresses at an ever-increasing rate. His discussion relative to this, though short, is perhaps the most sparkling passage of the book.

In review, one must say that it is surprising what the author has got into this single volume. There is a wealth of illustration, which is excellent in every way and of the greatest help to the reader, to whom a picture is usually worth a large amount of text, and to whom it is so valuable in that a pictorial memory is much more frequent than a scriptorial one. Indeed, in such high esteem does the reviewer hold a good illustration, that he has been in the habit of describing it as a 'potted' aphorism.

Not only has the book amply achieved all the author set out for it to do, but it serves as a great stimulus to thought, and it will undoubtedly be very highly welcome wherever it is read. No one interested in the evolution of mankind should be without it.

BACTERIAL POLYSACCHARIDES

Bacterial Polysaccharides. By Martin Burger. (Pp. 272 + ix. 45s.) Illinois, U.S.A.: Charles C. Thomas. Oxford, England: Blackwell Scientific Publications.

Contents: 1. Historical and Introduction. 2. Pneumococcus Polysaccharides. 3. Enzyme Studies on Bacterial Polysaccharides and in Infections. 4. Streptococcus Polysaccharides. 5. Neisseria Polysaccharides. 6. Vibrio Polysaccharides. 7. Anthrax Polysaccharides. 8. *Eberthella Typhosa* Polysaccharides. 9. Polysaccharides of the Mycobacteria. 10. Dysentery Bacilli Polysaccharides. 11. Genus *Hemophilus* Polysaccharides. 12. Polysaccharides of the *Salmonella*. 13. Brucella Group Polysaccharides. 14. Staphylococcus Polysaccharides. 15. Polysaccharides of the More Important *Klebsiella, Escherichia, Aerobacter*, and *Proteus* Groups. Appendix.

This is an excellent historical survey of 'those bacterial polysaccharide substances which are more or less directly related to infection and immunity'. Each chapter or section dealing with a particular bacterial species is divided into:

i. A brief account of the microbe;

ii. A description in chronological order of the methods used for the extraction of its polysaccharides;

iii. An account of the chemical and immunological properties of the extracts followed in some cases by a description of the uses to which they have been put.

This arrangement, though logical, is tedious because the properties of an extract depend so much on the manner of its preparation.

To review critically the literature on substances which as a class are so difficult to purify, and are so ill-defined as the bacterial polysaccharides, is a difficult task which the author has on the whole accomplished well. More attention might perhaps have been devoted to the few polysaccharides or complexes which have been at least partially purified and less to the many of which only the immunological properties have been more than cursorily studied. Of the better characterized products, some are pure polysaccharides, others contain amino acids, fatty substances or other groupings, some are antigens, others are haptens or are without apparent immunological significance, some probably originate from the bacterial surface, others are liberated only by extensive disintegration of the cell. The book would perhaps be more valuable and easier to read if these distinctions had been more clearly emphasized. Some of the subject matter, such as the short section on antibodies (which are more closely related to proteins than to carbohydrates), is irrelevant and in places detailed experimental data are given without mention of the amount of initial culture or extract to which they refer. While the author has covered the literature painstakingly, there are signs that the book was hastily written and the proofs read rather carelessly.

The book is recommended as an admirable introduction to the subject and should perform an important service by revealing the large gaps in our knowledge of this interesting field.

EXPERIMENTAL PHYSIOLOGY

Experimental Physiology for Medical Students. By D. T. Harris, M.D., D.Sc., F. Inst. P., H. P. Gilding, M.A., M.D., and W. A. M. Smart, B.Sc., M.B., B.S. (Pp. 305 + viii. With 266 illustrations and plate in colour. Fifth edition, 21s.) London: J. & A. Churchill Limited. 1951.

Contents: 1. Excitation of Tissues. 2. Physiological Dissection. The Preparation of Animals for Experiments. 3.-6. The Circulation. 3. The Physical Properties of Blood. 4. The Heart. 5. The Blood Vessels. 6. The Circulation in Man. 7. Pulmonary Ventilation. 8. Analysis of the Respiratory Gases and Energy. 9. Body Temperature. 10. The Gases of the Blood and Tissue Respiration. 11. The Reaction of the Blood. 12. The Digestive Organs. 13. Water Distribution. 14. The Contractile Tissues. 15. Physiology of Nerve and the Effects of Galvanism and Faradism in Man. 16. The Central Nervous System. 17. The Physiology of the Sense Organs. 18. Exercises in Experimental Pharmacology. Index.

According to the title, the book is intended for medical students, and it is stated in the preface that difficulty is no obstacle to-day since the excellence of the scientific training in schools enables all the experiments to be classed as students' exercises. There must be a considerable difference between British schools and those of less happy lands, or is it perhaps that the authors no longer are in direct, daily contact with second-year medical students? As pointed out in the review of the 4th edition in this *Journal* in 1948, the complex diagrams of circuits for audiometers or encephalographs are positively frightening even to the ordinary physiology lecturer, who finds it difficult enough to make his students understand the working of a simple induction coil.

Although the hundreds of experiments in the book—of which an ordinary class would only have time to carry out some 2–3% in a year—are clearly described, some of the introductory remarks are certainly quaint in their old-fashioned way. Thus, under specific gravity of the blood: 'For example, in the impoverished condition of the blood in chlorosis the blood volume is much increased, while the specific gravity is markedly lowered.'

It would appear to be high time that the methods of examination and approach taught in human experimental physiology become the same as those used in clinical medicine. Each subject in the curriculum grows at an ever-increasing rate and unless some co-ordination or stream-lining is undertaken, so that nothing once learnt is redundant and has to be forgotten, the task of the medical student becomes impossible. This book would benefit by revision on these lines.

CORRESPONDENCE

RAND MEDICAL STUDENTS' CONFERENCE ON CANCER

To the Editor: Your attention is invited to a conference on the subject of *Cancer* to be held by the Students' Medical Council of the University of the Witwatersrand.

For the past seven years it has been the custom at this Medical School to hold an annual conference on a subject of medical interest viewed in the light of conditions peculiar to South Africa. Past conferences have included subjects such as tuberculosis, venereal disease and Bantu medicine.

Although at first sight it would appear that the subject of cancer does not warrant discussion in this field, we feel that a better perspective of the problem of cancer as it applies to South Africa will be gained from a coherent presentation of facts which have as yet not been correlated. In addition, certain speakers will present the results of investigations which have recently been undertaken.

The aims of the Conference are to present problems viewed from the South African angle and to stimulate student activity in local research. In the past, Conferences have not succeeded, owing to lack of enthusiasm on the part of students. This attitude is particularly to be deplored amongst Witwatersrand students since the Conference is the only one of its kind organized by medical students in South Africa. It is hoped that this year will prove to be the start of a more lively appreciation of local problems amongst medical students.

The Programme of the Conference is briefly as follows:

Friday, 8 June (8.00 p.m.):
Official Opening and Statement of the Problem.

Saturday, 9 June (All day, commencing at 9 a.m.):
Significance in South Africa.
Research and Etiology.

Monday, 11 June (Afternoon and evening commencing at 2 p.m.):
Early diagnosis.

Tuesday, 12 June (Afternoon and evening, commencing at 2 p.m.):
Therapy.

The sessions will include a talk on *Statistics Essential to Research* and *The Physics of Radiation*, plus the showing of films on Cancer, some of which were made by the British Ministry of Health in April of this year.

Dr. S. Lopis of the Department of Medicine, Witwatersrand Medical School, has very kindly agreed to become Graduate Chairman of the Conference Committee. To him and to Dr. P. Keen and Dr. C. Berman, our graduate advisers, we extend our warm appreciation for the advice and assistance they have given us.

V. F. Weinstein.
Director of Publicity: Conference Committee.

Students' Medical Council,
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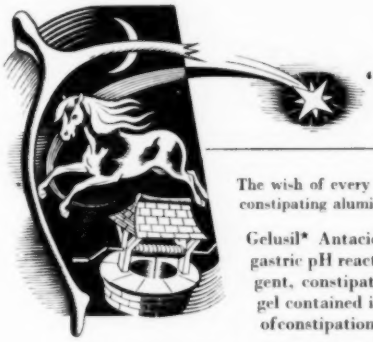

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'ANTI-BI-SAN' may be given to children and adults: it is absolutely safe and side-reactions are very rare. For further details about this valuable immunising product please write to the Distributors:—

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** This experimental finding (F. Obstet. Gynaec. Brit. Emp. Vol. 40. No. 6) has been confirmed in obstetric practice.*

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No. 11

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- Guaranteed to conform to the requirements of the 1948 British Pharmacopœia and the Specification of the South African Bureau of Standards. Equal to the finest imported Ether.
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For further information please write to the selling Agents

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301 Smith Street, P.O. Box 43, Durban

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The Medical Association of South Africa
Die Mediese Vereniging van Suid-Afrika

AGENCY DEPARTMENT : AGENTSKAP AFDELING

JOHANNESBURG

Medical House, 5 Esselen Street. Telephones 44-9134-5
Mediese Huis, Esselenstraat 5. Telefone 44-9134-5

PRAKTYKE TE KOOP : PRACTICES FOR SALE

(Pr/S14) Transvaal country practice. Income approx. £1,000 p.a. Transferable appointment held. Premium £500.
(Pr/S16) Transvaal hospital town. Income £2,300. No surgery done. Practice is for sale with large house at £5,000.
(Pr/S23) Progressive practice in S. Rhodesian hospital town. Excellent opportunity for young G.P. Present income £3,000–£4,000 p.a. Premium for goodwill £3,000. Terms accepted. £1,000 for book debts, surgery furniture, drugs, etc. Block of professional rooms and living quarters to rent at £30 p.m.
(Pr/S25) Johannesburg prescribing practice. Gross income £1,600 p.a. Premium for quick sale £600 including furniture, instruments and drugs. Practice can be considerably expanded if surgery is undertaken.
(Pr/S26) Suid-Westelike Transvaalse plattelandse praktyk in hospitaal dorp. Bruto inkomste £2,400 p.a. Premium £2,000.
(Pr/S27) Practice in Bloemfontein in deceased estate. Net income £1,000 p.a. This income does not indicate the size of the practice as the late principal was not concerned with the business side thereof. Premium £500 or near offer.

ASSISTENTE VERLANG : ASSISTANTS REQUIRED

(A/O23) Assistant required for East Rand practice immediately. Possibility of partnership. Terms £75 per month. Must be bilingual.
(A/O24) Doctor required by Insurance Company in South West Africa. Minimum period 6 months. To commence 1 June. Salary £75 per month plus all found, rising to £100 in third month.
(A/O25) Salisbury, S. Rhodesia. Assistantship for minimum of 6 months. Salary £100 p.m. inclusive. Accommodation available at £15 p.m. Applicant must have own car.

ASSISTENTSKAP VERLANG : ASSISTANTSHIP REQUIRED

(A/W46) Assistantship with view in English-speaking practice by London-trained doctor, aged 31. Interested in Obstetrics.

CONSULTING ROOMS TO LET

(R/O6) To share central fully furnished consulting rooms with use of receptionist and telephone from 9 a.m. to 11 a.m. or afternoons.

* * * *

CAPE TOWN : KAAPSTAD

Medical House, P.O. Box 643, Cape Town. Telephone 2-6177
Mediese Huis, Posbus 643, Kaapstad. Telefoon 2-6177

PRAKTYKE TE KOOP : PRACTICES FOR SALE

(673) Near Durban. Average gross receipts £1,650 p.a. Prescribing. Premium required £1,275. One appointment £200 p.a. Good scope for expansion. Double-storied seven-roomed house situated on 1¼ acres and separate surgery building for sale at £6,500. Surgery may possibly be rented by arrangement at approx. £8 p.m. Picturesque surroundings. Climate notably cooler than that of the coast. English community.
(662) Platteland. Ontvangste vir afgelope 13 maande £1,766 13s. Premie verlang vir klandisiewaarde en meubels £1,000, £600 kontant, balans paaiemente. Huishuur £6 10s. p.m.
(644) Durban Central. Mainly Indian and Native cash practice. Average annual gross income £1,235. Premium of £500 required for goodwill, inclusive of furniture and fittings and drugs. Terms may be arranged.

ASSISTENT, PLAASVERVANGERS VERLANG ASSISTANT, LOCUMS REQUIRED

(721) Noord-Kaapland. Vanaf ongeveer 15 Junie vir 1 maand. verkieslik eie kar.
(723) S.W. Cape. Assistant required—with possibility of partnership—for practice in hospital town. £75 p.m. Car provided for use in practice. Dwelling available.
(725) For partnership practice in pleasant Cape hospital town near sea. From 23 June to 23 July. Usual fees.

Provincial Administration of the Cape of Good Hope

(HOSPITAL DEPARTMENT)

HOSPITAL BOARD SERVICE
QUEEN MARY HOSPITAL, UITENHAGE

VACANCY: MEDICAL PRACTITIONER GRADE 'A'

Applications are invited from registered medical practitioners for appointment to the post of Medical Practitioner Grade 'A' at the Queen Mary Hospital, Uitenhage.

The appointment will be made in terms of and will be subject to the Hospital Board Service Ordinance 1941 and the regulations framed thereunder.

Salary on the scale £500—£600—£660—£720 per annum plus a temporary cost-of-living allowance as prescribed from time to time by the Administrator.

The successful applicant will be required to enter into a contract which shall not exceed a period of four years and shall be subject to termination at any time on 90 days' notice on either side.

Applications, containing particulars of experience, qualifications, etc., together with copies of testimonials and stating the earliest date on which duty can be assumed, to be forwarded to reach the Medical Superintendent, Queen Mary Hospital, P.O. Box 177, Uitenhage, not later than noon on *Tuesday*, 12 June 1951.

(B 1732)

The South African Institute for Medical Research

JOHANNESBURG, SOUTH AFRICA

Applications are invited from registered specialist pathologists for appointment to the senior and assistant senior grades in the Routine Diagnostic Division of the Institute. Special experience in one or other of the major subjects, Biochemistry, Histopathology, Haematology, and Bacteriology, into which the Division is sub-divided will be a recommendation.

Salary scales of the senior and assistant senior grades are £1,450 × 100—£1,750 and £1,000 × 100—£1,400 respectively plus a variable cost-of-living allowance which is approximately £190 per annum; the starting notch will be determined by the experience and qualifications of the applicant.

Membership of the Staff Provident Fund is compulsory and a certificate of sound health will be required.

Full particulars upon application to:—The Director, S.A. Institute for Medical Research, P.O. Box 1038, Johannesburg.

(Staff 10. E/51.)

Lyttelton Health Committee

Applications are invited from registered medical practitioners for appointment as part-time Medical Officer of Health to the above Local Authority.

The salary attaching to the post will be £60 per annum.

Applications addressed to the Secretary, Lyttelton Health Committee, P.O. Box 13, Lyttelton, Transvaal, will be received up to noon on Saturday, 30 June 1951.

(1/M/1)

Gesondheidskomitee van Lyttelton

Aansoeke word ingewag van geregistreerde geneeshere vir aanstelling as deeltydse Mediese Gesondheidsbeampte vir bogenoemde plaaslike bestuur.

Die salaris aan die betrekking verbonde sal £60 per jaar wees.

Aansoeke wat gerig moet word aan die Sekretaris, Gesondheidskomitee van Lyttelton, Posbus 13, Lyttelton, Transvaal, sal ontvang word tot middag op Saterdag, 30 Junie 1951.

(1/M/1)

National Hospital, Bloemfontein

VACANCIES

Applications are hereby invited from candidates with suitable qualifications for the following posts at the National Hospital and Tempe Provincial Hospital, Bloemfontein.

Applications must be posted to reach the Medical Superintendent before 12 June 1951, and must contain full particulars concerning age, professional qualifications, experience and marital status of the applicants who must indicate the earliest date on which duty can be assumed if appointed.

(a) Registrars in Surgery at a salary of £400 to £600 per annum according to previous experience, plus free quarters. If accommodation is not available then £100 per annum will be added to the salary in each case. Applicants for these posts must be qualified for at least two years.

(b) Senior Resident Medical Officer in the Department of Medicine, at a salary of £300 per annum, plus free quarters.

Successful applicants will be expected to produce satisfactory certificates concerning qualifications.

In addition to annual salaries employees at present receive a cost-of-living allowance at Government Rates.

All appointments are subject to the Hospital Regulations as amended.

J. W. Wessels
Medical Superintendent
(Z203457)

14 May 1951

National Hospital, Bloemfontein

PART-TIME MEDICAL, SURGICAL AND DENTAL STAFF

Applications are invited from duly qualified and registered medical practitioners and dentists for the following vacancies at the National Hospital and Provincial Hospital, Tempe.

Surgeons	3
Gynaecologist-Obstetrician	1
Assistant Gynaecologist-Obstetrician	1
Obstetrician	1
Physicians	4
Paediatrician	1
Ear, Nose and Throat Surgeons	2
Ophthalmologists	2
Dentists	3
Out-Patient's Medical Officer	1
Pathologist	1
Psychiatrist	1
Dermatologist	1

Particulars are obtainable from the Secretary, National Hospital. Applications stating date of birth must reach the undersigned not later than Tuesday, 12 June 1951.

J. W. Wessels
Medical Superintendent
(Z203457)

14 May 1951

Wanted

Applications are invited for the position of junior assistant medical officer. Monthly salary will range according to qualification and experience from £60 plus £16 2s. cost-of-living allowance to £75 plus £17 12s. cost-of-living allowance.

Date of commencement of duty will be on or as soon as possible after 1 July 1951.

Particulars concerning the appointment as well as the prescribed application forms may be obtained from The Chief Medical Officer, O'Okiep Copper Co. Ltd., P.O. Box 11, Nababeep, C.P.

Wanted

Assistant wanted for practice in Cape Peninsula, 7 miles from Cape Town. Own car essential. Apply with full particulars, stating age, qualifications, etc., to 'A. G. O.', P.O. Box 643, Cape Town.

Nasionale Hospitaal, Bloemfontein

VAKATURES

Aansoeke word hiermee ingewag van kandidate met geskikte kwalifikasies vir die volgende poste by die Nasionale Hospitaal en Tempe Provinsiale Hospitaal, Bloemfontein.

Aansoeke moet gerig word om die Geneesheer-Direkteur te bereik voor 12 Junie 1951, en moet volle besonderhede bevat aangaande die ouderdom, professionele kwalifikasies, ondervinding en huwelikstaat van die applikant en moet voorts 'n aanduiding bevat van die vroegste datum waarop diens aanvaar kan word indien aangestel.

(a) Registrateurs in Chirurgie met salaris van £400 na £600 per jaar na gelang van vorige ondervinding, plus vry inwoning op hospitaalterrein. In geval inwoning op hospitaalterrein nie beskikbaar is nie, word £100 per jaar in iedere geval by salaris gevoeg. Applikante vir hierdie poste moet minstens twee jaar gekwalifiseerd wees.

(b) Senior Huisdokter, Departement van Interne Geneeskunde teen 'n salaris van £300 per jaar plus vry inwoning.

Van persone wat aangestel word, sal verwag word om bevredigende sertifikate in te dien aangaande kwalifikasies.

Benewens jaarlikse salarisse ontvang werknemers op die oomblik lewenskostetoelae teen Staatstarief.

Alle aanstellings geskied in terme van die Hospitaalregulasies soos gewysig.

J. W. Wessels
Geneesheer-Direkteur
(Z203457)

14 Mei 1951

Nasionale Hospitaal, Bloemfontein

DEELTYDSE GENEESKUNDIGE, SJIRURGIESE EN TANDHEELKUNDIGE PERSONEEL

Aansoeke van behoorlik gekwalifiseerde en geregistreerde geneeshere en tandartse word ingewag vir die volgende vakatures op die diensstaat van die Nasionale Hospitaal en Provinsiale Hospitaal, Tempe.

Sjirurge	3
Ginekoloog-Verloskundige	1
Assistent Ginekoloog-Verloskundige	1
Verloskundige	1
Interniste	4
Kinder-Spesialis	1
Oor, Neus en Keel-Spesialiste	2
Oogartse	2
Tandartse	3
Buitepasiënte Geneesheer	1
Patoloog	1
Psigiater	1
Dermatoloog	1

Besonderhede is verkrygbaar by die Sekretaris, Nasionale Hospitaal, en aansoeke met vermelding van geboortedatum moet die ondergetekende uiterlik op Dinsdag, 12 Junie 1951 bereik.

J. W. Wessels
Geneesheer-Direkteur
(Z203457)

14 Mei 1951

Wanted

Partnership or assistantship with view to partnership in Johannesburg area. English, 32, F.R.C.S. (Eng.), experienced in major surgery; knowledge of Afrikaans. Write to 'A. G. N.', P.O. Box 643, Cape Town.

Medical Locum

Experienced general practitioner available for locum work anywhere. Apply to 'Advertiser', P.O. Box 3607, Cape Town.

Required: Southern Rhodesia

Assistant with view to partnership, or a partner. Write to 'A. G. R.', P.O. Box 643, Cape Town.

For Sale

Nucleus of Native practice in Transkei village. Present owner an invalid. Apply to 'A. G. S.', P.O. Box 643, Cape Town.

The University of Natal

PIETERMARITZBURG AND DURBAN

THE FACULTY OF MEDICINE

POST OF FULL-TIME DEAN

The Council of the University invites applications for the post of full-time Dean of the newly established Faculty of Medicine for non-European students at Durban (South Africa). The salary is £1,500 per annum. In addition a temporary cost-of-living allowance is payable at the rate of £256 per annum for a married person and £109 4s. for a single person.

Membership of the University Provident Fund is compulsory.

The successful candidate, who will hold professorial rank, will be required to organize and administer the Faculty of Medicine, and would in due course become available as a candidate for such teaching post as might be warranted by his qualifications.

Candidates must hold a medical qualification registrable with the South African Medical and Dental Council.

Ten copies of the application, each accompanied by a full statement of qualifications and experience, the names of at least three referees, a certificate of good health, and a statement as to when duties could be commenced at the earliest must be lodged on the prescribed form *not* later than 1 September 1951 with the Registrar, University of Natal, P.O. Box 375, Pietermaritzburg (Natal, South Africa), from whom forms and further particulars of the post are available.

(11/13)

The University of Natal

PIETERMARITZBURG AND DURBAN

THE FACULTY OF MEDICINE

CHAIR OF ANATOMY

The Council of the University invites applications for the Chair of Anatomy in the newly established Faculty of Medicine for non-Europeans in Durban.

The salary attaching to the post is £1,500 per annum. In addition, a temporary cost-of-living allowance is at present payable at the rate of £256 per annum in the case of a married and £109 4s. in the case of a single person.

Membership of the University Provident Fund is compulsory.

The successful candidate will in addition to his teaching duties, be required to organize, staff and administer the Department of Anatomy in the Faculty of Medicine.

Candidates must hold medical qualifications which are registrable with the South African Medical and Dental Council and teaching experience and higher qualifications in Anatomy will be a recommendation.

Ten copies of the application, each accompanied by a full statement of qualifications and experience, the names of at least three referees, a certificate of good health, and a statement as to when duties could commence at the earliest must be lodged *not* later than 1 September 1951 with the Registrar, University of Natal, P.O. Box 375, Pietermaritzburg, from whom the prescribed form and further particulars of the post are obtainable.

(11/13)

Required

Part-time medical practitioner to attend office staff of approximately 40 individuals. Remuneration on a *per capita* basis of 10s. per month. Apply to "P. C.", P.O. Box 758, Johannesburg.

(1381/51)
(P.104/1)

Practice for Sale: Natal

Established, mixed general practice in large town. Income over £2,000. Premium 1 year's purchase. House for sale. Write to "A. G. P.", P.O. Box 643, Cape Town.

The University of Natal

PIETERMARITZBURG AND DURBAN

THE FACULTY OF MEDICINE

CHAIR OF PHYSIOLOGY

The Council of the University invites applications for the Chair of Physiology in the newly established Faculty of Medicine for non-Europeans in Durban.

The salary attaching to the post is £1,500 per annum. In addition, a temporary cost-of-living allowance is at present payable at the rate of £256 per annum in the case of a married and £109 4s. in the case of a single person.

Membership of the University Provident Fund is compulsory.

The successful candidate will in addition to his teaching duties, be required to organize, staff and administer the Department of Physiology in the Faculty of Medicine.

Candidates must hold medical qualifications which are registrable with the South African Medical and Dental Council and teaching experience and higher qualifications in Physiology will be a recommendation.

Ten copies of the application, each accompanied by a full statement of qualifications and experience, the names of at least three referees, a certificate of good health, and a statement as to when duties could commence at the earliest must be lodged *not* later than 1 September 1951 with the Registrar, University of Natal, P.O. Box 375, Pietermaritzburg, from whom the prescribed form and further particulars of the post are obtainable.

(11/13)

Kimberley Hospital

MEDICAL STAFF VACANCIES

Applications on the appropriate Form Staff 23, which is obtainable from the undersigned or from any hospital in the Cape Province, are invited for the following posts:—

Junior Resident Officers (Interns). Salary £240 per annum, plus board, quarters, and temporary cost-of-living allowance. The appointments are tenable for a commencing period of six months from 1 July 1951, or as arranged. Applications will be considered from candidates writing the June Final Examinations.

The appointments will be made in terms of and subject to the provisions of the Hospital Board Service Ordinance No. 19 of 1941 (Cape).

Closing date for receipt of applications Saturday, 9 June 1951.

L. F. Abrahams
Acting Kimberley Branch Representative
Cape Provincial Hospitals Department
(B 963)

P.O. Box 618
Kimberley
15 May 1951

Kimberley Hospitaal

MEDIESE STAF VAKATURES

Aansoeke op die geskikte Vorm Staf 23, welke van die ondergetekende of van enige hospitaal in die Kaapprovinsie verkrygbaar is, word ingewag vir die volgende poste:—

Junior Inwoonbeamptes (Interns). Salaris £240 per jaar, plus losies en kwartiere en tydelik lewenskostetoelaag. Die aanstellings beloop ses maande vanaf 1 Julie 1951 of soos gereël. Aansoeke van kandidate wat die Finale Eksamens in Junie skryf sal oorweeg word.

Die aanstellings sal gemaak word ooreenkomstig en onderhewig aan die bepalings van die Hospitaalraaddiensordonnansie nommer 19 van 1941 (Kaap).

Sluitingsdatum vir die ontvangs van applikasies Saterdag, 9 Junie 1951.

L. F. Abrahams
Waarnemende Kimberley Takverteenwoordiger
Kaapse Provinsiale Hospitale-afdeling
(B 963)

Posbus 618
Kimberley
15 Mei 1951

Provincial Administration of the Cape of Good Hope

(HOSPITAL DEPARTMENT)

VACANCY: JUNIOR RESIDENT MEDICAL OFFICER (INTERN)

SIR HENRY ELLIOT HOSPITAL, UMTATA

Applications are invited from suitably qualified persons for the abovementioned post. The salary applicable thereto is £240 per annum plus the cost-of-living allowance at Civil Service rates and free board, quarters and laundering.

The appointment will be on contract for a period of six months as from 1 July 1951, and may be extended by mutual agreement.

The appointment will be made in terms of and be subject to the Hospital Board Service Ordinance No. 19 of 1941 and the Regulations framed thereunder.

Applications on Forms Staff 23 (in duplicate), which are obtainable from all Hospital Offices in the Cape Province, must be addressed to the Medical Superintendent, Sir Henry Elliot Hospital, Umtata, so as to reach him not later than noon on Friday, 8 June 1951.

G. W. Jarmain
Branch Representative

P.O. Box 202
Umtata (O.1116)
17 May 1951

Public Service Commission

VACANCIES IN THE PUBLIC SERVICE

1. The attention of medical practitioners, registered with the South African Medical and Dental Council, is drawn to an advertisement appearing in the *Government* and *Provincial Gazettes* of this week, inviting applications for a post of District Surgeon (salary scale £960–40–£1,120) in the Department of Health (Nylstroom).

2. In addition to salary a cost-of-living allowance of £256 for married officers and £80 for unmarried persons is payable for the present.

3. It is emphasized that full and detailed particulars of qualifications and previous experience (including military service) must be furnished but original certificates and testimonials should not be submitted. Application forms (Z.83 and P.S.C. 8(a)) are obtainable from the Secretary, Public Service Commission, Pretoria, to whom filled-in forms must be addressed.

4. The closing date for the receipt of applications is 15 June 1951. (28875)

LABORATORY TECHNICIAN

WANTED

For small factory hospital catering for all types of medical conditions, a female laboratory technician to take charge of all pathological work under the medical officer.

Further particulars regarding conditions, etc., from:

FACTORY SECRETARY

A.E. & C.I. Ltd. **Umbogintwini**

U. 266

Provincial Administration of the Cape of Good hope

(HOSPITALS DEPARTMENT)

VACANCIES FOR JUNIOR RESIDENT MEDICAL OFFICERS

Applications are invited for appointment to posts of junior resident medical officer in the departments of surgery, obstetrics and gynaecology, oto-rhino-laryngology and ophthalmology, and medicine (including paediatrics), at the Frere Hospital, East London.

The salary attached to the posts is at the rate of £240 per annum, plus free board, quarters and laundering, or an allowance in lieu thereof at the rate of £90 per annum, and plus the prescribed temporary cost-of-living allowance.

The appointments will be made in terms of, and be subject to, the provisions of the Hospital Board Service Ordinance, No. 19 of 1941 (Cape), and the regulations framed thereunder.

The appointments will be tenable for a period of six months commencing from 1 July 1951.

Applications must be made on the prescribed form (Staff 23), which is obtainable from the Medical Superintendent, Frere Hospital, East London, to whom all completed forms must be addressed.

The closing date for the receipt of applications will be 15 June 1951.

H. F. Allen
Branch Representative

East London (2142)
15 May 1951

Provinsiale Administrasie van die Kaap die Goeie Hoop

(HOSPITAALDEPARTEMENT)

VAKATURES VIR JUNIOR INWONENDE MEDIESE BEAMPTES

Aansoeke word ingewag vir aanstelling in poste van junior inwonende mediese beampte in die departemente van chirurgie, verloskunde en ginekologie, oto-rhino-laryngologie en ophthalmologie, en geneeskunde (insluitende paediatrie), by die Frere Hospitaal, Oos-Londen.

Die salaris aan die poste verbonde is teen £240 per jaar, plus vrye kos, inwoning en klerewas, of 'n toelaag in plaas daarvan teen £90 per jaar, en plus die geskikte tydelike lewenskostetoelaag.

Die aanstellings geskied ingevolge, en onderworpe aan, die Ordonnansie op Hospitaalraadsdiens, No. 19 van 1941 (Kaap), en die regulasies wat ingevolge daarvan opgestel is.

Die aanstellings is vir ses maande houbaar, vanaf 1 Julie 1951.

Aansoeke moet gedoen word op die voorgeskrewe vorm (Staf 23), wat verkrygbaar is van die Mediese Superintendent, Frere Hospitaal, Oos-Londen, aan wie alle ingevulde vorms gerig moet word.

Die sluitingsdatum vir ontvangs van aansoeke sal 15 Junie 1951 wees.

H. F. Allen
Takverteenwoordiger

Oos-Londen (2142)
15 Mei 1951

Frontier Hospital, Queenstown

VACANCIES FOR INTERNS

Applications are invited from suitably qualified persons for the above posts at the Frontier Hospital, Queenstown. Salary £240 per annum, plus cost-of-living at prescribed rates, plus free board, quarters and laundry.

Applications to be addressed to the Medical Superintendent, Frontier Hospital, P.O. Box 107, Queenstown. (2838)

Printed by Cape Times Ltd., Parow, and Published by the Proprietors, THE MEDICAL ASSOCIATION OF SOUTH AFRICA, MEDICAL HOUSE, 35 Wale Street, Cape Town. P.O. Box 643. Telephone 2-6177. Telegrams: 'Medical'

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ALKALOIEDVRYE
Pynverdowende en Rumatiekmiddel. Vry van nadelige uitwerking op hart en asemhaling.

Bottels van 25, 100 en 500 tablette (5 grein). Bottels van 1 ons poeier. Dosies van 5 ampules (50 % oplossing, 2 ks.).

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Nou in die Unie van Suid-Afrika vervaardig!

VIR GEWRIG- EN SPIERRUMATIEK, LENDEJIG, HEUPJIG, EN JIG

Dikwels doeltreffend wanneer salisilate faal.

Ook bekend as Novaldin.

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a significant advance in the treatment of ventricular arrhythmias . . . .

. . . . PRONESTYL *Hydrochloride*

less toxic than quinidine

Indications and Dosage

IN CONSCIOUS PATIENTS

For the treatment of ventricular tachycardia:

Orally: 1 Gm. (4 capsules) followed by 0.5-1.0 Gm. (2 to 4 capsules) every four to six hours as indicated.

Intravenously: 200-1000 mg. (2 to 10 cc.). *Caution*—administer no more than 200 mg. (2 cc.) per minute.

Hypotension may occur during intravenous use in conscious patients. As a precautionary measure, administer at a rate no greater than 200 mg. (2 cc.) per minute to a total of no more than 1 Gm. Electrocardiographic tracings should be made during injection so that injection may be discontinued when tachycardia is interrupted. Blood pressure recordings should be made frequently during injection. *If marked hypotension occurs, rate of injection should be slowed or stopped.*

For the treatment of runs of ventricular extrasystoles:

Orally: 0.5 Gm. (2 capsules) every four to six hours as indicated.

IN ANESTHESIA

During anesthesia, to correct ventricular arrhythmias:

Intravenously: 100-500 mg. (1 to 5 cc.). *Caution*—administer no more than 200 mg. (2 cc.) per minute.

Supply

Pronestyl Hydrochloride Capsules, 0.25 Gm., bottles of 100.
Pronestyl Hydrochloride Solution, 100 mg. per cc., 10 cc. vials.

PRONESTYL *Hydrochloride*

SQUIBB PROCAINE AMIDE HYDROCHLORIDE

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Further information and literature is available from

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